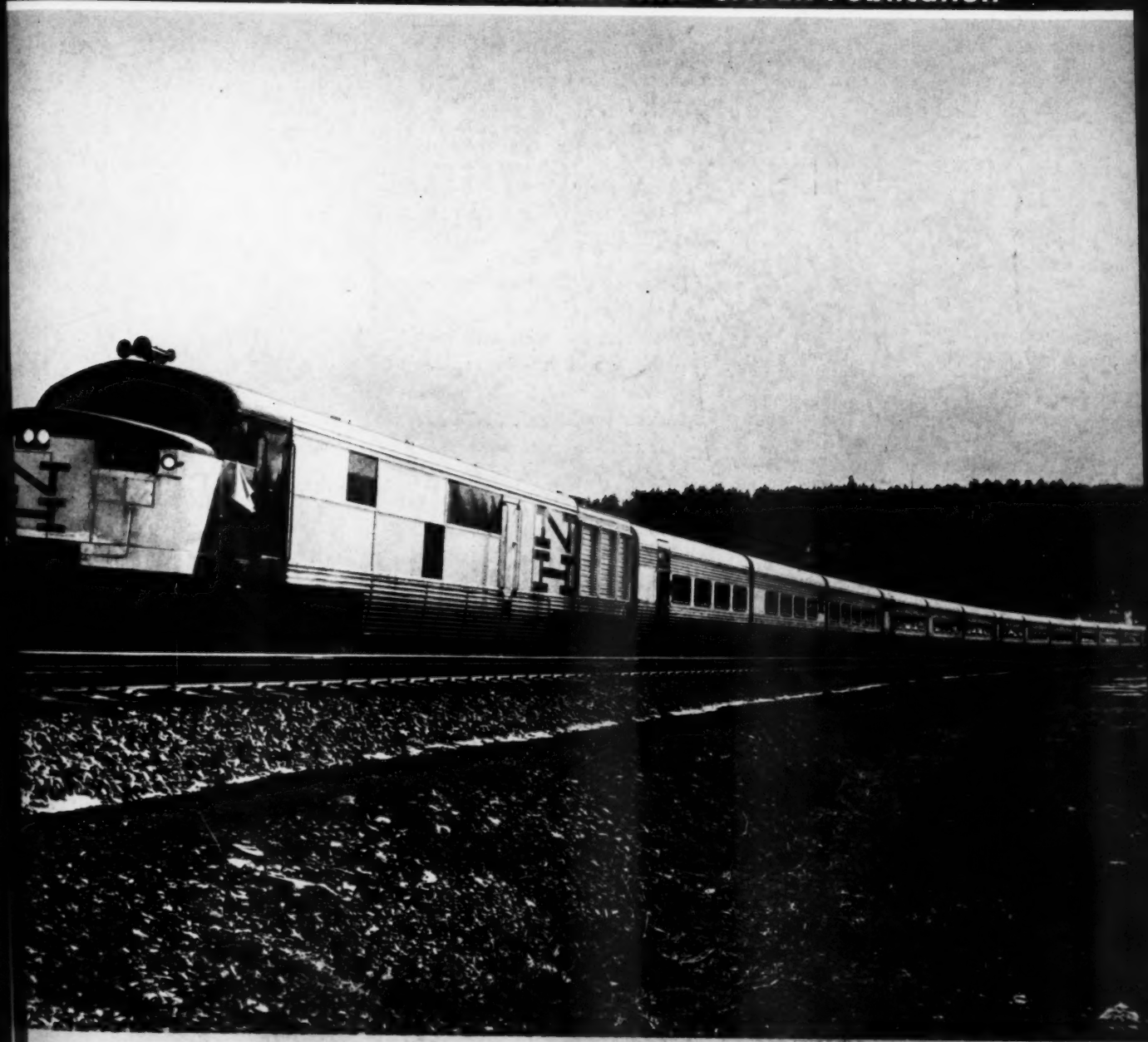
SEPTEMBER 1957

RAILWAY TRACK and STRUCTURES

A Simmons-Boardman TIME-SAVER Publication



THE NEW HAVEN'S "JOHN QUINCY ADAMS"

RAIL JOINT COMPANY
DIVISION OF POOR & COMPANY, INC.
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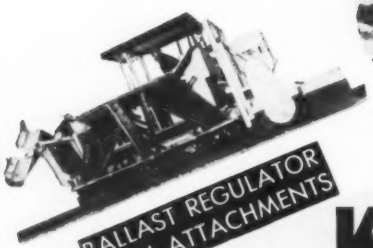
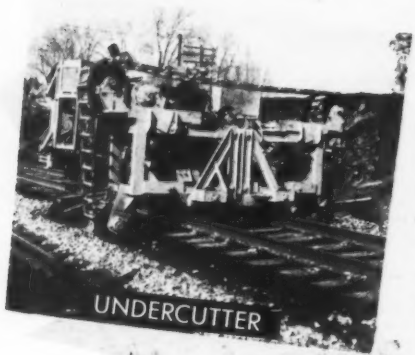


BALLAST REGULATOR WITH ATTACHMENTS

KERSHAW

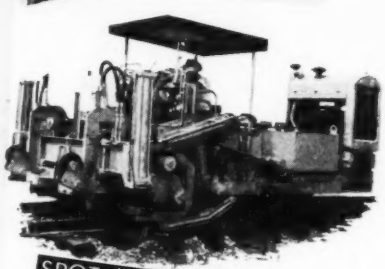
Leader in the Maintenance Field!

FOREMAN'S SIGHT CAR



UNDERCUTTER

Kershaw machines pictured on this page are at work today on railroads throughout the world helping solve a multitude of track maintenance problems . . . Whether it be individual performance or work in various maintenance packages, the Kershaw line of trackwork equipment, proven on the job, truly is first in the railway maintenance field.



SPOT (MULTIPLE) TAMPER

BALLAST CLEANER

Now **... more than ever ...**

Recognize This Symbol of Leadership ...

TWO-WHEEL KRIBBER

KERSHAW
MANUFACTURING CO. INC
MONTGOMERY ALABAMA

TRACK BROOM

No bolt-holes through the track for this guard rail

This is Bethlehem's Hook Flange Guard Rail Model 751, as rigid and rugged a guard rail as you're ever likely to see. Yet the 751 is the easiest of all guard rails to install. No bolt-holes to drill through the running rail, no clamps to imbed in the ballast.

There are bolts, yes. These bolts secure the guard to the tie plates, not to the running rail. The tie plates, in turn, contain a contoured recess (see "A" in sketch) to receive the 751's special hooked flange (B) which passes under a portion of the running rail. The weight of the passing train thus keeps the guard from flinching no matter how hard the lateral thrust.

The tie plates are double-shouldered through the straight guarding area, bearing against the bases of both rails to prevent spreading. Additional strength is provided by thick side braces which are heavily welded in position on the plates.

The Hook Flange Guard Rail is one of the safest devices of its kind ever made; to our knowledge none has ever broken under traffic. That's saying a lot, because there are thousands of Bethlehem Hook Flange Guard Rails in service on the country's most heavily-travelled railroads. A nearby Bethlehem representative will be glad to cover any additional points with you. Just get in touch with the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

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BETHLEHEM STEEL

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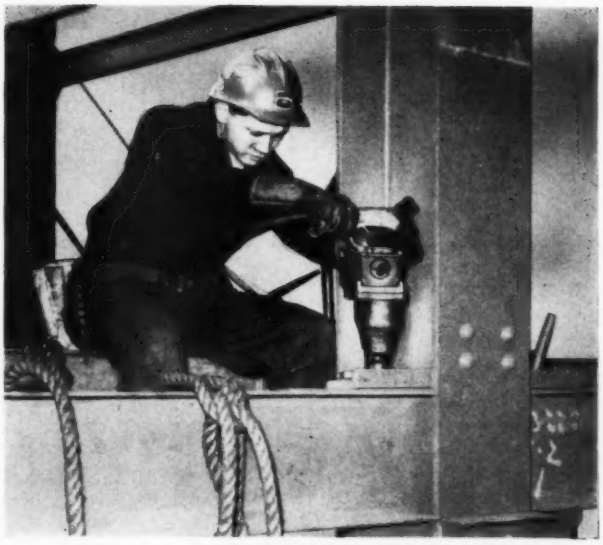
You can't beat

CP EQUIPMENT FOR BRIDGE AND BUILDING!



The CP-610 Air Wrench is ideal for pre-bolting or running high strength bolts for permanent assembly. The CP-610 meets requirements for turn-of-the-nut method for proper tensioning of high strength bolts . . . it's 7 pounds lighter and 2 inches shorter than any tool of comparable rating, yet delivers up to 50% more torque output.

You can't beat

CP Portable "Power Vane" Rotary Compressors for a completely dependable air supply. Available in 125, 210, 365, 600, and 900 cu. ft. models.

You can't beat

a lightweight CP Triple Scaler! 7000 blows a minute hammers old paint, rust or scale without damaging underlying surfaces.

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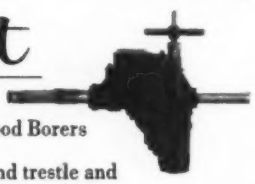

easy handling CP Reversible Wood Borers for boring up to 4" holes on bridge and trestle and other timber construction work.

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the CP Boyer Rivet Buster! Has a powerful 11" stroke—easily cuts 1" rivets—and has quick change retainer for chisels and backing out punches.

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CP Air Grinders and Wire Brush Machines for their well-balanced handling qualities. They remove a maximum amount of metal and scale in record time.

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CP Portable Sump Pumps for removing dirty water and oil from Diesel Engine pits. Draw water down to within 7/8" from bottom of the pump base.

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SPEED RECORDERS AND INDICATORS • STATIONARY AND PORTABLE AIR COMPRESSORS • PNEUMATIC AND ELECTRIC TOOLS • HYDRAULIC RIVETERS

Rock Island

MANNIX Sled is unloaded beside track and is introduced beneath track by jacking up rails and ties and pushing sled under with a bulldozer.

New Cost-Saving Operation
through use of HYDRAULIC CONTROLS

LATEST MANNIX Ballast Sled in use on the Rock Island railroad features a new factor which eliminates the piling up or bunching together of ties. The hydraulic controls give the operator a means of adjusting the leveling device to completely overcome the improper leveling of the old tie bed.

TRACK is lowered onto sled which is then coupled by cables to a locomotive.

HYDRAULIC PUMP is operated by one trackman while sled is in motion, for adjusting the tilt of the rear scraper blades.

SCRAPER BLADES are adjusted by hydraulic rams (one on each flap) for controlling digging action. Blade extensions were applied for widening roadbed.

MANNIX INTERNATIONAL INC.

Phone: WAlnut 7-9411
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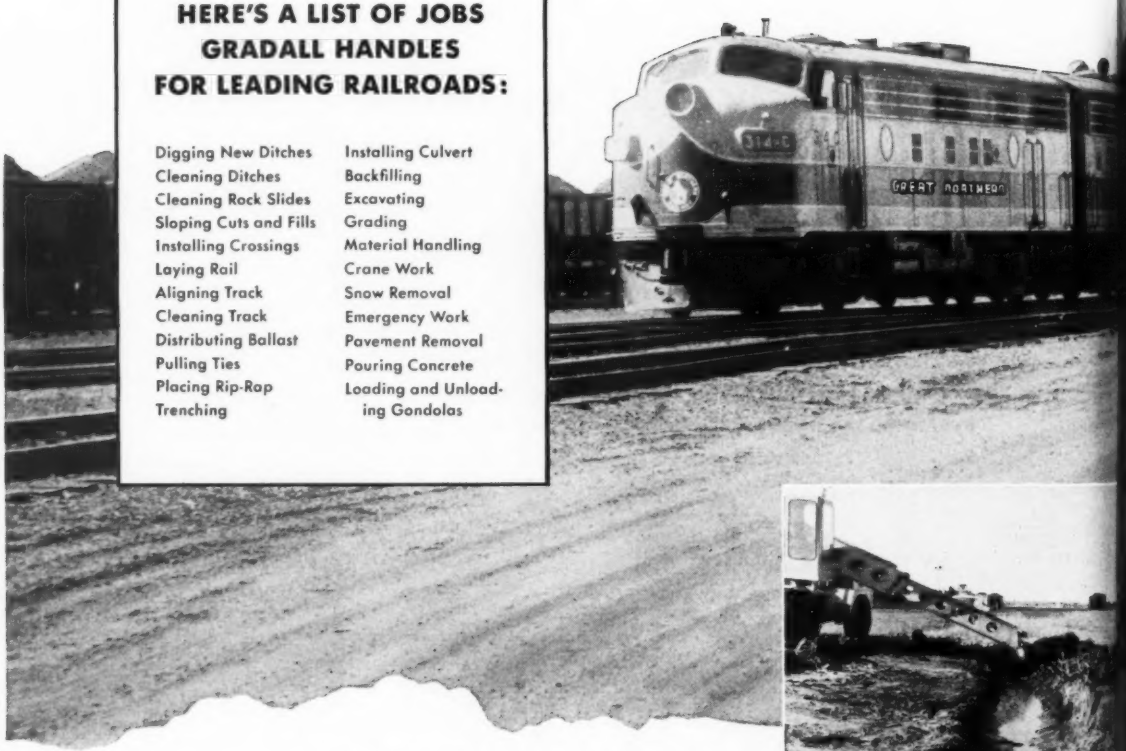
a week...all year lon

for Great Northern Railwa

HERE'S A LIST OF JOBS GRADALL HANDLES FOR LEADING RAILROADS:

- Digging New Ditches
- Cleaning Ditches
- Cleaning Rock Slides
- Sloping Cuts and Fills
- Installing Crossings
- Laying Rail
- Aligning Track
- Cleaning Track
- Distributing Ballast
- Pulling Ties
- Placing Rip-Rap
- Trenching
- Installing Culvert
- Backfilling
- Excavating
- Grading
- Material Handling
- Crane Work
- Snow Removal
- Emergency Work
- Pavement Removal
- Pouring Concrete
- Loading and Unloading Gondolas



Great Northern Railway uses their Gradall to dig a 3 x 3-foot drainage ditch at the rate of 125 feet per hour in clay. Only a single operator is required—no clean-up is necessary. Gradall does the entire job.

COMPLETE MAINTENANCE-OF-WAY WITH ONE MACHINE... A GRAD

GREAT NORTHERN RAILWAY'S 7000-car Allouez yard in Superior, Wisconsin, is confronted with a constant drainage problem, because it's bordered by a large swampy area. Their former method of digging and cleaning drainage ditches tied up both track and manpower, which proved quite costly.

Now, using their new multi-purpose Gradall, Great Northern easily cleans a mile of ditch daily—as compared to 200 feet a day by dragline. On new ditch construction, Gradall digs in dry clay at the rate of 125 feet per hour. One scoop and the ditch is finished—no help is needed behind the Gradall to level off. Levelling is easily handled with the back of the digging bucket.

Great Northern's Gradall has proved to be a versatile worker—operating 8 hours a day, 40 hours every week throughout the year. Other railroad owners keep their Gradalls at the work site overnight—only returning to the yards when the jobs are finished.

Other jobs Gradall easily handles at Allouez include: Stacking 400-pound chunks of ice in a store house during the winter months, eliminating an operation that formerly required 8 full-time men; and clearing ore that drops from the cars onto the tracks—80 carloads have been picked up in a 4-week period. Cleaning is now much more thorough than with their conventional track cleaning equipment.

Call us to arrange a free field demonstration of the new Railroad Gradall on your maintenance-of-way jobs. Or write direct to Gradall Division, The Warner & Swasey Co., Cleveland 3, Ohio.

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for

PAVING BREAKERS

CLAY SPADERS

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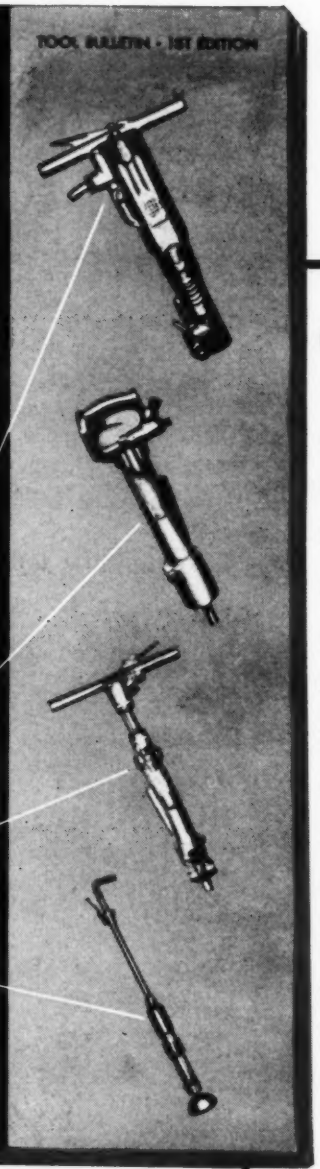

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...yours for the asking

Gardner-Denver demolition and maintenance tools are *shot-peened* to stand up under hard use. Many operators report 3 times normal service life. Gardner-Denver provides world-wide service from 50 branch offices, 9 plants. Send for your copy of our new Tool Bulletin.

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IN CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

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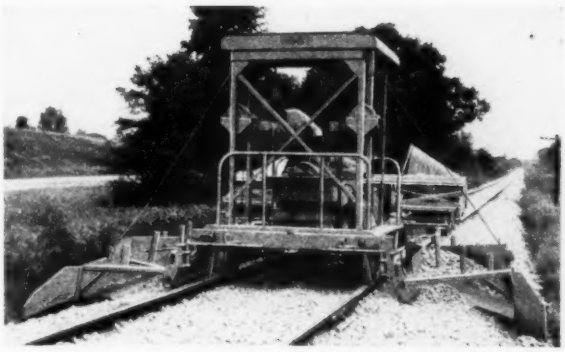
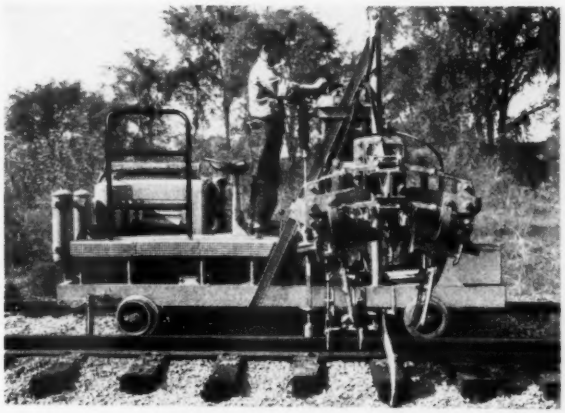
KALAMAZOO meets the exacting needs of modern maintenance-of-way men . . . right down the line!



KALAMAZOO MODEL 29 SWEEPER AND EQUALIZER

Transfers ballast from shoulder onto ties for tamping. Scarifies fouled ballast. Shapes, smooths and levels shoulder and berm. Broom assembly moves excess ballast from center of track to outside. Sweeps up thoroughly after all other operations are completed. *Send for Bulletin TS-1.*



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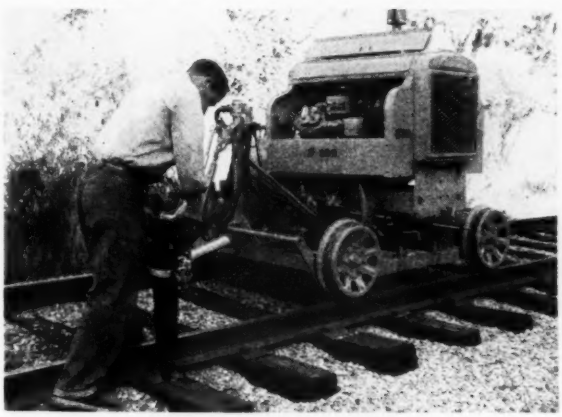
Now even faster! Raises, nips, levels, jacks and tamps ties. Minimum settling. Electric vibratory tamping action. *Send for Bulletin HM-1B.*



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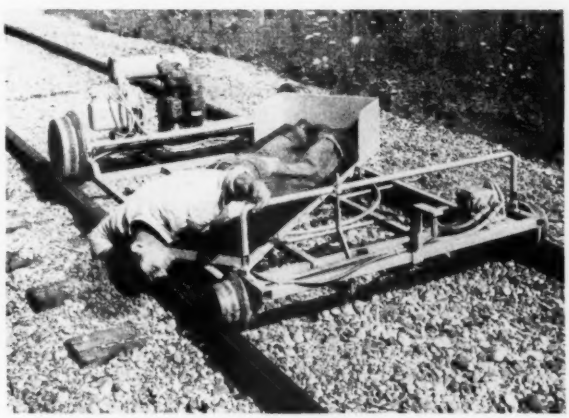
Self-propelled, easy to position. Spikes both sides of each rail. Utilizes existing compressors, giving you low cost spiking equipment. *Send for Bulletin SD-1.*



KALAMAZOO MODEL FSC FOREMAN'S CAR

Makes track sighting faster, easier, more accurate on raising, surfacing, spotting and construction operations. Has smooth hydraulic drive. *Send for Bulletin FSC-1.*

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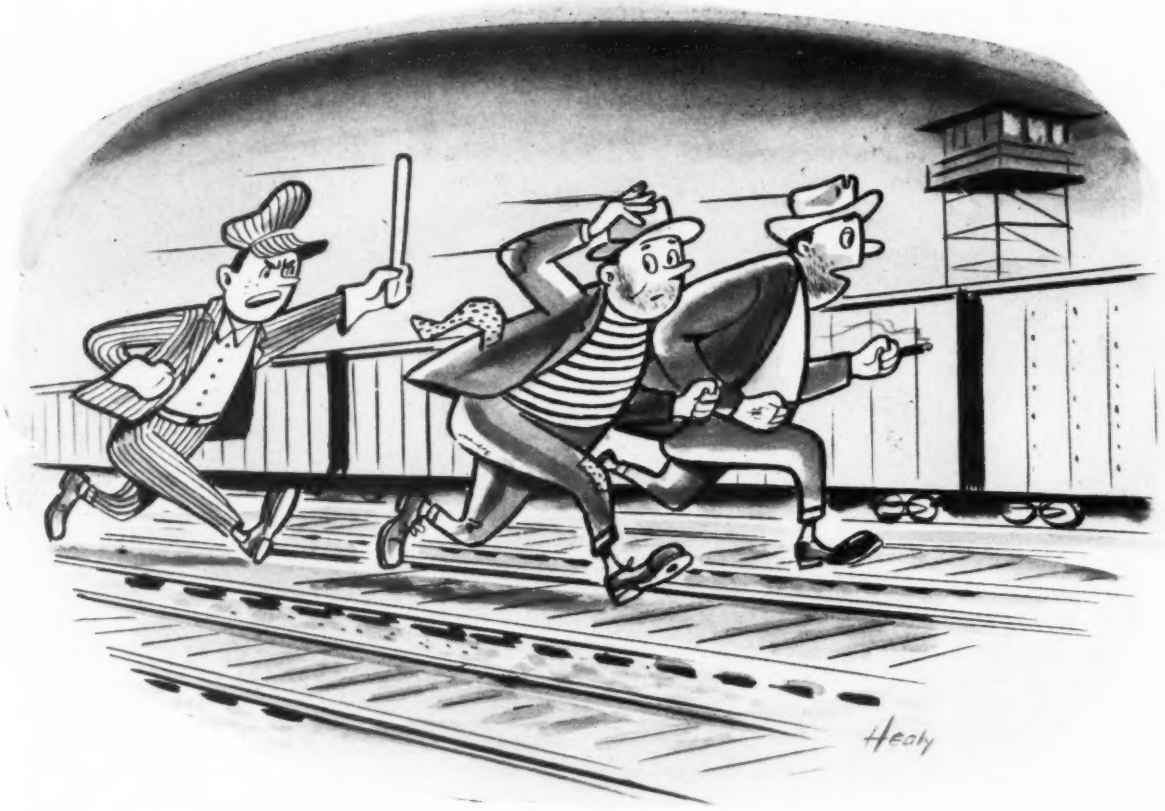

"There's no weeds and brush to hide in anymore . . . they've killed 'em with Chipman chemicals!"

Chipman chemicals and application service are backed by 45 years of railroad experience. An extensive line of weed, grass and brush killers is available to meet varying conditions. Included are:

Atlacide	Chlorea	Brush Killer
Atlas "A"	Chlorax	Telvar W
Atlas "D"	TCA	Borax

Let us solve *your* weed problems with the *right* chemicals and application service!

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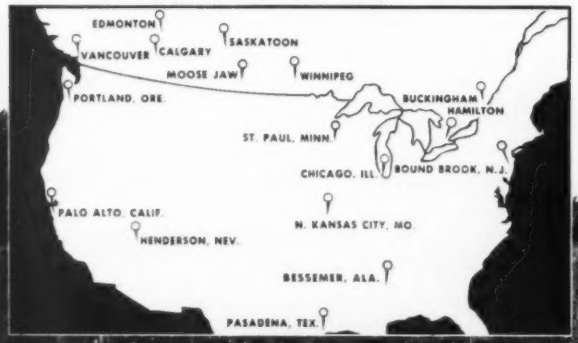
Chemical Company, Inc.

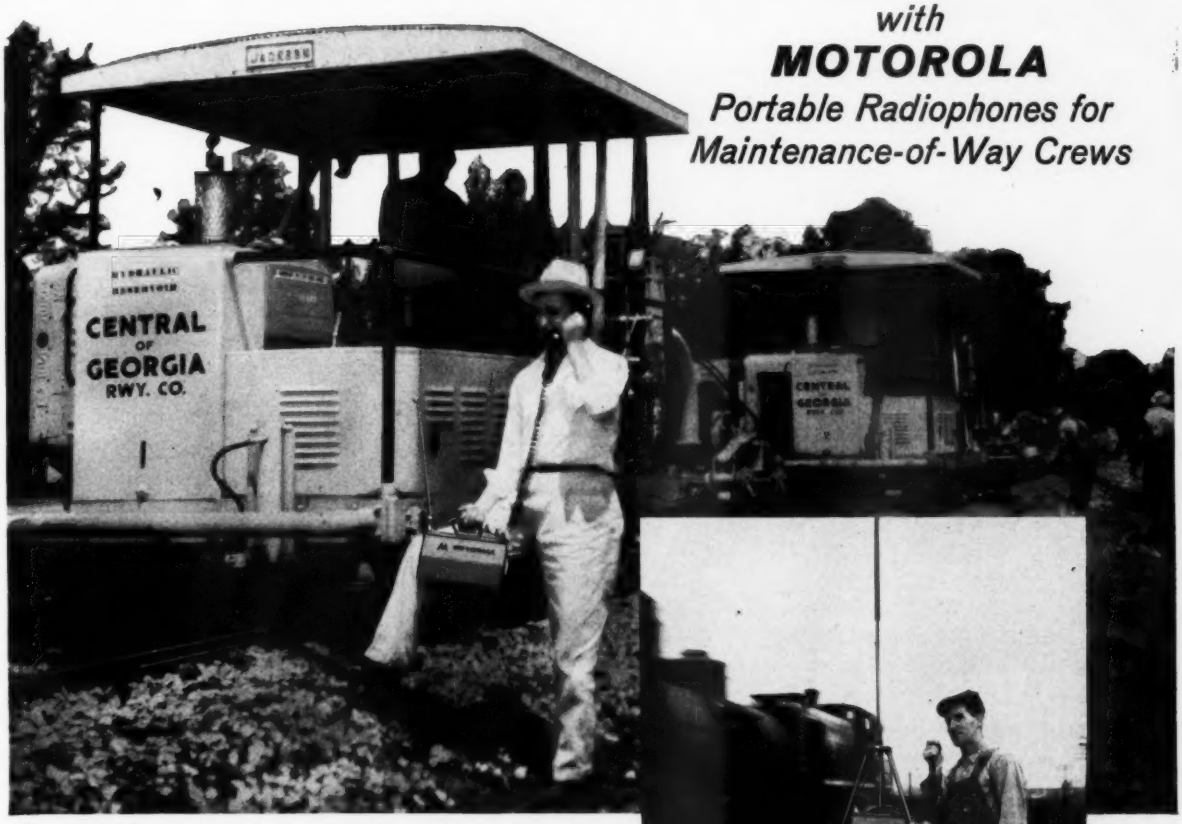
Bound Brook, New Jersey

17 Strategically Located Chipman Plants



MORE TRACK WORK...FEWER TRAIN DELAYS

with
MOTOROLA
Portable Radiophones for Maintenance-of-Way Crews



Gang foreman keeps in constant touch with approaching trains.

Flagman with tripod mounted radio.

Ask the foreman of a two-way radio-equipped road gang what benefits his railroad and his men get, and you may be surprised and interested in the answer. With constant information on the approach of trains, he has more time to work before clearing the track. The result of this close coordination with oncoming trains often is hundreds of additional feet of track work per day.

Then, look at Maintenance-of-Way radio from the operating standpoint. Fewer costly train stoppages, regular schedules through work areas, lower per diem costs, better all 'round operating efficiency.

Let a Motorola railroad specialist show you why Motorola equipment has been chosen by 100 U.S. Railroads . . . how it will pay for itself in operating savings.

MOTOROLA *2-WAY RAILROAD RADIO*

Motorola Communications & Electronics, Inc. • A Subsidiary of Motorola Inc. • 4501 Augusta Boulevard, Chicago 51, Ill.

Finished view of new Armco Retaining Wall. Existing culvert near center serves to drain toe of slope.

Driven piles at left failed to stop slide. Note slippage in foreground.

Gravel was placed after each bin was completed.

Close-up shows workmen bolting stringers in place.

Sliding Railroad Fill Stabilized With Armco Retaining Wall

In Kentucky, in 1952, an existing fill for a major railroad was widened to accommodate an additional track siding. Recently, after several extended periods of rainy weather, the fill became unstable and the track was declared unsafe because of continued movement of fill.

To restore service quickly and eliminate costly maintenance, the railroad's officials decided to stabilize the fill by excavating the toe of the slope and installing an Armco Bin-Type Retaining Wall. Each bin of the 320-foot-long Armco Wall was backfilled with gravel to facilitate drainage and further minimize the possibility of sliding.

* * *

All-metal Armco Retaining Walls are composed of deeply corrugated sections bolted together. They gain stability from both the weight of the fill material and the structure itself. But unlike ordinary walls, Armco Retaining Walls adjust themselves to unequal settlement without cracking or bulging.

Find out how Armco Retaining Walls can solve *your* earth-control problems at low cost. Write us today. Armco Drainage & Metal Products, Inc., 5447 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

ARMCO BIN-TYPE RETAINING WALLS

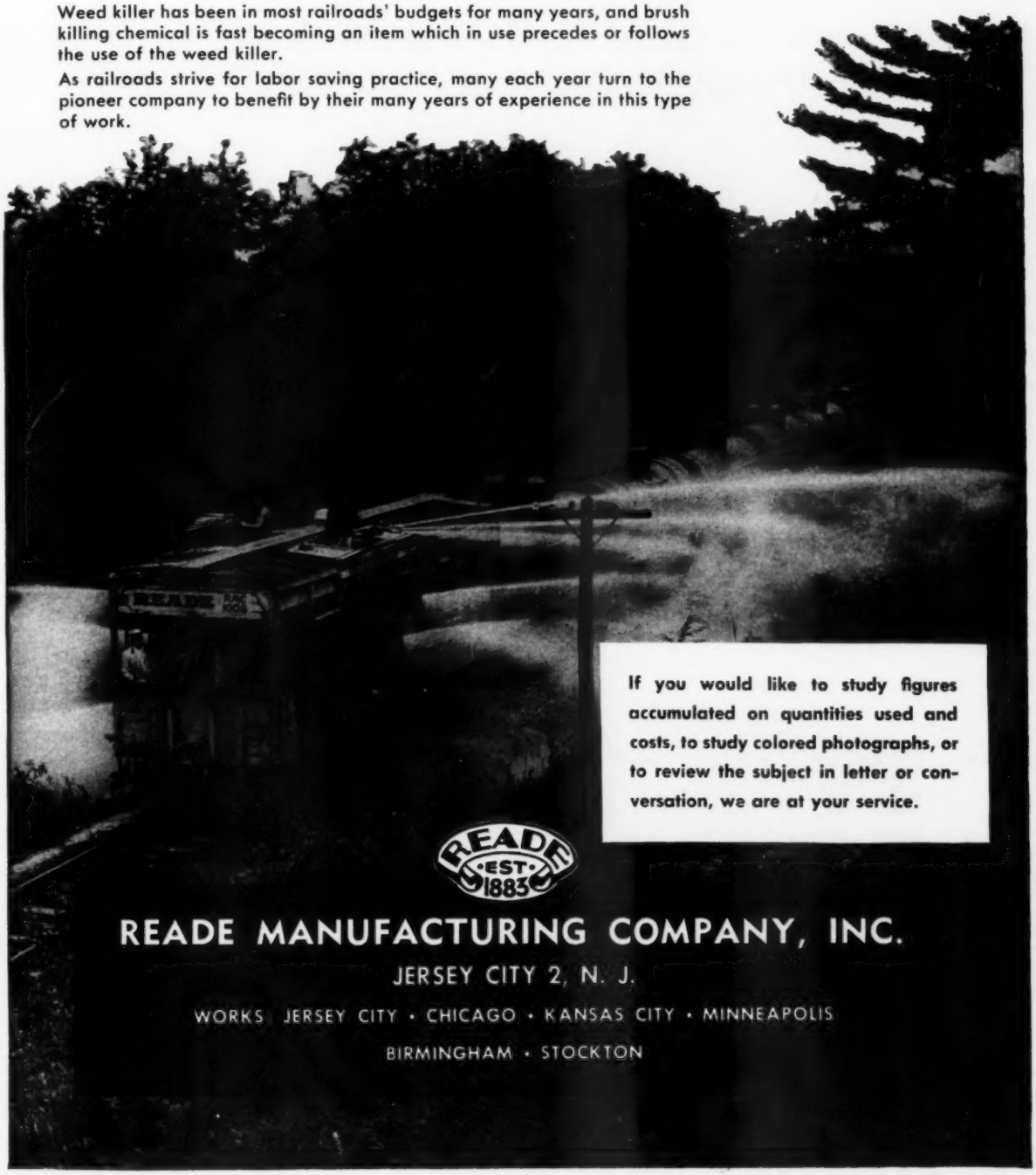
ARMCO®

HIGH STANDARDS OF MAINTENANCE AND NEED FOR ECONOMY

. . . Now Compel The Use Of Both Weed And Brush-Killing Chemical On The Well Managed Railroad:

Weed killer has been in most railroads' budgets for many years, and brush killing chemical is fast becoming an item which in use precedes or follows the use of the weed killer.

As railroads strive for labor saving practice, many each year turn to the pioneer company to benefit by their many years of experience in this type of work.



If you would like to study figures accumulated on quantities used and costs, to study colored photographs, or to review the subject in letter or conversation, we are at your service.

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New P-S Power Ballaste
for faster, more economic

NEW P-S HYDRAULIC POWER BALLASTER features versatile split head, high capacity stroke selection and simplified design

The new, completely redesigned Pullman-Standard Power Ballaster, incorporating hydraulic drive and control, is one of the most effective tamping machines yet developed. The versatile, out-in-front, split crosshead allows independent operation for more efficient and thorough tamping with an improved tamping action, adjustable length of stroke and selective tamping depth. The completely new Power Ballaster can effectively tamp any raise in any ballast. Simplified, advanced design means less maintenance, fewer parts, easier accessibility ... and lubrication is minimized by using oil enclosed drives throughout.

If you would like to see the new Pullman-Standard Power Ballaster in operation or for more information on how this new machine can help you streamline your maintenance of way operation and lower your operating costs as well, write to the Track Equipment Department, Pullman-Standard Car Manufacturing Company, 1414 Field Street, Hammond, Indiana.

...*New* P-S Tie Spacer
maintenance of way

NEW P-S TIE SPACER—for the first time . . . mechanized tie spacing for ALL conditions plus exceptional economy

The new Pullman-Standard Tie Spacer is the first machine ever offered to mechanize tie spacing operations. This self-powered, on-track machine, is capable of handling any tie spacing and straightening program. This revolutionary machine, hydraulically operated, will space and straighten new and old ties during heavy tie renewal operations, provide for out-of-face spacing where the number of ties per rail is changed, and as a partner of the new Pullman-Standard Power Ballaster straighten and space ties ahead of the tamping operation during track surfacing jobs. In addition, the P-S Tie Spacer can be used to nip and hold ties for spiking. Railroads will find that this new machine, requiring but one man to operate, can perform the work of a 6 man tie spacing crew and in only the fraction of the time.

For details on the new P-S Tie Spacer or for an appointment to see it in operation, write to the Track Equipment Department, Pullman-Standard Car Manufacturing Company, 1414 Field Street, Hammond, Ind.

WORLD'S LARGEST BUILDER OF ROLLING STOCK

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During the 18 year history of continuous rail, installation time and welding costs have constantly decreased . . . Hundreds of miles of this safe, trouble-free rail are already in service in all sections of the country, and major railroads are installing more all the time.

Reduce your track, roadway, and rolling stock maintenance, and improve riding qualities. Look to LINDE, the leader in continuous rail welding, and plan for RIBBONRAIL Service now. Call or write the Railroad Department of Linde Company.

look to **LINDE** *for* **RIBBONRAIL** *service*
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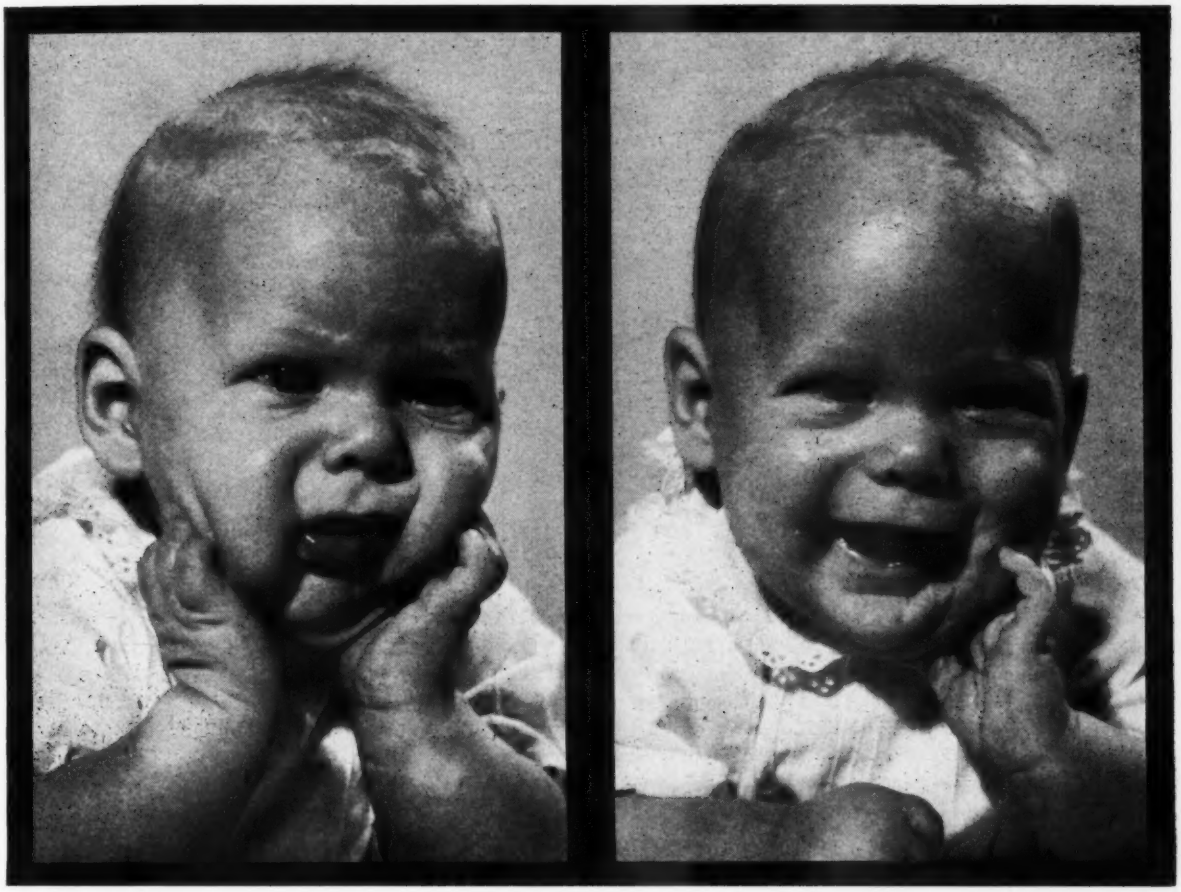


Boy, did I goof this year!

I didn't use Bogle Chemical Weed and Brush Control.

I've got it made this year!

I used Bogle Chemical Weed and Brush Control.

You don't need a course in chemistry to appreciate Bogle's chemical control of weeds and brush. We have a crew of trained technicians and a fleet of modern, up-to-the-minute spray cars ready for your particular needs. Continuous "on-track" research has shown us the most effective chemical for each specific situation. Call us in and we'll map out a program together.

The R. H. Bogle Company

ALEXANDRIA, VIRGINIA MEMPHIS, TENNESSEE

BURRO CRANES

Handle Continuous Rail From End to End . . .

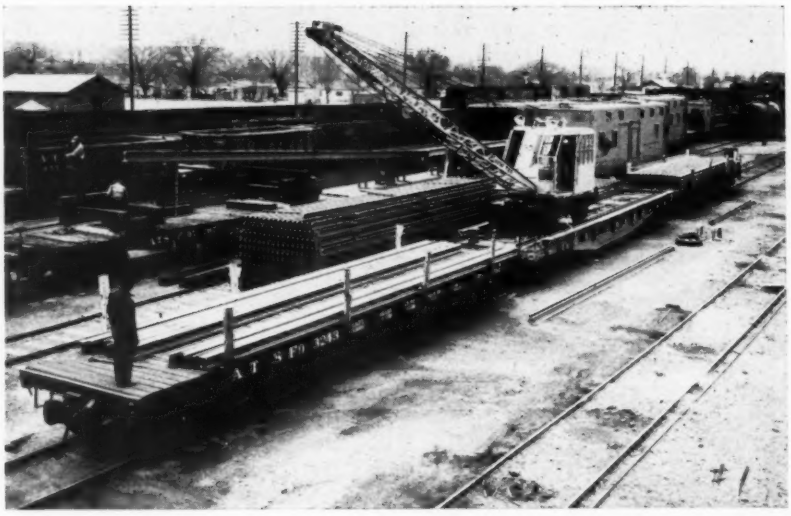


Fig. 1

Speed Track Programs On Many Roads

The wider acceptance and increasing use of continuous welded rail has added another to the long list of jobs Burro Cranes are doing on the railroad today.

Track men learned at the outset, that these powerful, close-coupled railroad cranes could handle almost every phase of continuous rail operations from unloading rail at the welding site (above) to final positioning of the continuous rail. While most railroads use their Burro Cranes in the same manner for handling and laying the rail, maintenance-of-way men agree that the Burro is proving, once again, to be "the busiest and most efficient worker on the track." The powerful drawbar pull, excellent traction, and close-coupled design of Burro Cranes makes them ideal for the pulling, lifting and shifting required in handling welded rail. Although different railroads have developed individual techniques in setting the welded rail into place, the basic job is to move the rail from the shoulder where it has been unloaded, and placed in laying position.

One of the most successful techniques observed by Cullen-Friestedt engineers is illustrated here. In Fig. 2, a Model 30 Burro is seen shifting the new rail from the shoulder to the center of the track. A threader, suspended from the boom of the crane, guides the rail as it is lifted from the shoulder by the Burro backing down the track.

After the rail is shifted to the center of the track, the next operation, throwing out the old rail can also be handled by the Burro.

Fig. 2

Fig. 3

After ties are adzed and new tie plates are in place, the Burro moves forward (Fig. 3) shifting the continuous rail from the center of the track onto the tie plates which have been properly guaged. General practice is to spike every fifth plate. A close-up view (Fig 4) shows the positioning of the rail on the tie plates. Burro Rail Tongs are used to handle the rail in this operation, as they permit better control as the rail is set to guage.

Fig. 4

Write for Model 30 Catalog — contains complete details, specifications and operating data. Sent without obligation.

CULLEN-FRIESTEDT CO.
1301 S. Kilbourn Avenue
Chicago 23, Ill.

1931 26 CONSECUTIVE YEARS 1957

MODERN BALLAST CONDITIONING

BEFORE *"R.B.C.C." Service*

AFTER *"R.B.C.C." Service*

"R. B. C. C." ballast cleaning service has earned its outstanding performance record from 26 years of successful operation. Our 3 and 5 unit trains are entirely self contained on our own standard railroad equipment—No railroad cars are used or tied up.

"R.B.C.C." 5 unit equipment does a thorough ballast conditioning job, cleaning two center ditches or two shoulders or one of each at one trip.

"R.B.C.C." 3 unit equipment, self propelled, does a thorough ballast conditioning job, cleaning one shoulder at one pass on one side only.

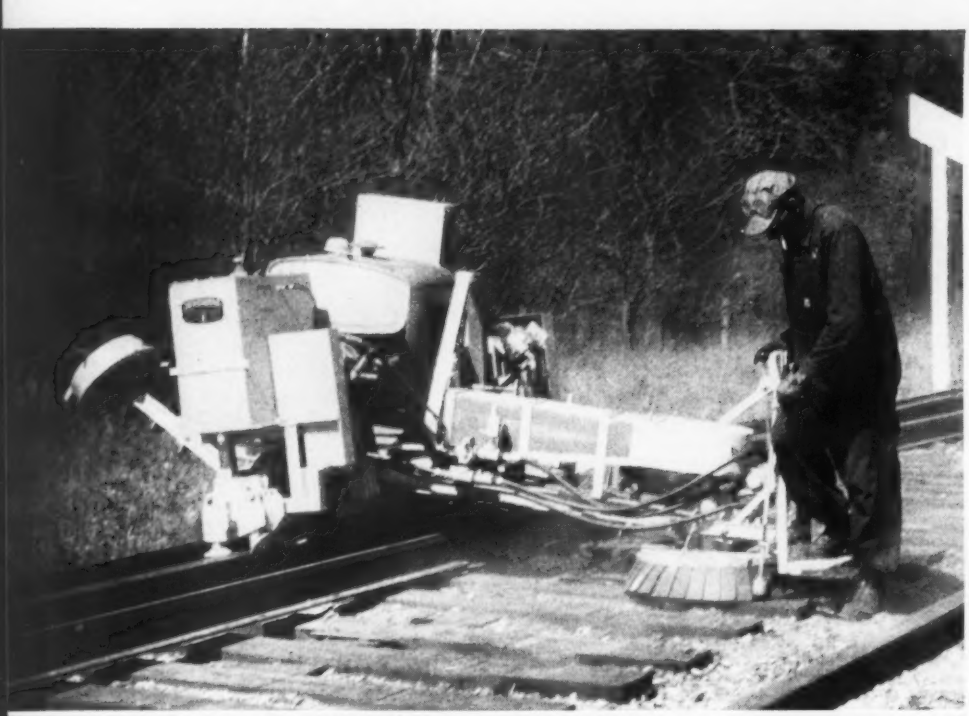
"R.B.C.C." ballast cleaning or excavating service, complete with our own personnel and equipment, is handled on contract basis.

RAND TOWER
MINNEAPOLIS, MINN.

METROPOLITAN BANK BLDG.
WASHINGTON, D. C.

Now... SELF-PROPULSION

adds to efficiency of NORDBERG ADZER and SPIKE PULLER



Cut Adzing Costs with Self-Propelled Adzer*

With self-propulsion, the well-known Nordberg Adzing Machine now becomes a *one-man* machine with greater power, to speed tie adzing. *Four* big features are now combined in the new Model CZ Adzer, to cut adzing costs:

(1) *Self-propulsion* . . . eliminates need for second man to move machine; (2) *Increased power* . . . 36 hp air-cooled engine delivers more power to cutter heads; (3) *Power feed* . . . provides for force feeding into ties—with maximum cutter bit efficiency; (4) *Patented bits* . . . new bit design increases service life at least 300%.

WRITE FOR BULLETIN 276

Increase production with Self- Propelled Spike Puller*

Here is another well-known Nordberg "*Mechanical Muscle*"® made even better . . . the Self-Propelled Spike Puller. Incorporating all the proved advantages of the regular Nordberg Mechanical Spike Puller, the new Self-Propelled unit now becomes a *two-man machine that boosts man-hour production 50%*. Utilizing a hydraulic pump and motor, the propulsion unit is "finger-tip"* controlled by the operator for precise forward or reverse motion.

Write for complete details covering the New Nordberg Self-Propelled Spike Puller and the Self-Propelled Adzer.

*Both of these NORDBERG Machines are also available without self-propulsion, if desired.

NORDBERG Mechanical Muscles®

NORDBERG MFG. CO.

Milwaukee, Wis.

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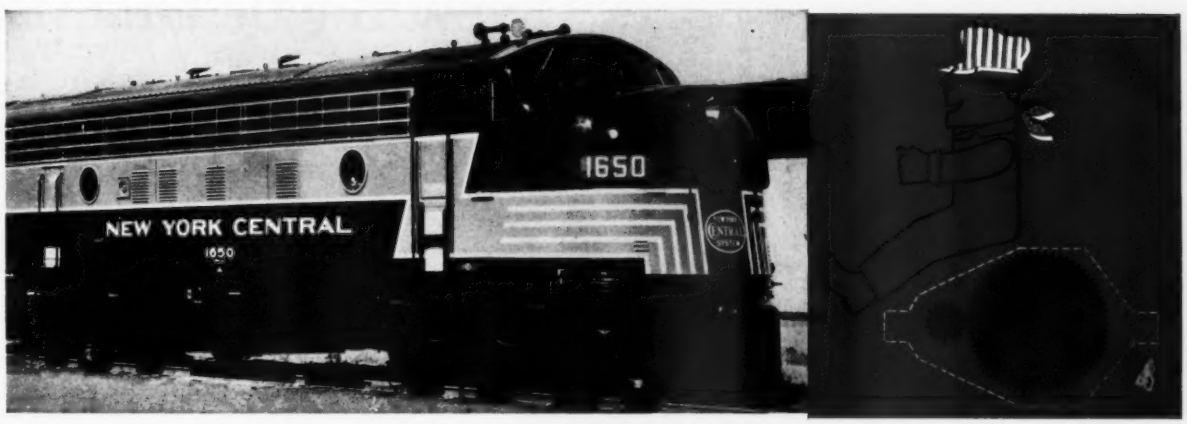
B452

PROVED!
DEPENDABLE TRACTION MOTOR GEAR LUBRICATION FOR OVER 6 MONTHS WITHOUT GREASE ADDITION!
NEW ESSO ARAPEN GEAR LUBRICANT



Extensive 18 month on-the-road tests by the New York Central Railroad have *proved* that Esso Standard's new Arapen Gear Lubricant gives completely dependable traction motor gear lubrication for well over six months. During the six-month periods *no* additional lubricant was required. Arapen outlasted the previously used lubricant by at least 6 to 1!

New Esso Arapen Gear Lubricant is another exclusive development of Esso Research. For further information and technical assistance in the use of Arapen Gear Lubricant, call your local Esso office, or write: Esso Standard Oil Company, Railroad Sales Division, 15 W. 51st Street, New York 19, N. Y.

Performance advantages of **ARAPEN GEAR LUBRICANT:**

Reduced Leakage: maintains consistency through full range of operating temperatures, minimizing drippage on ties, pits and station platforms.

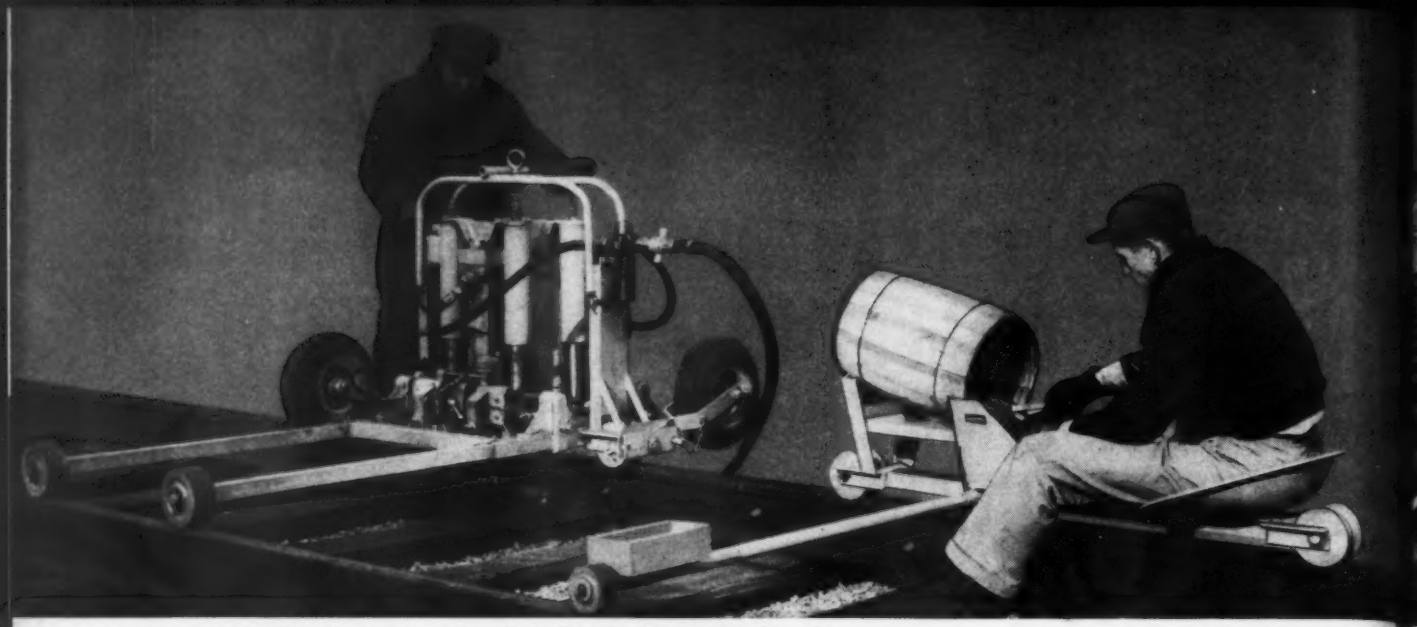
Improved Oxidation Stability: permits extended operation without hardening.

Excellent Structure Stability: reduces failures due to dry gears caused by excessive gear case leakage.

Better Anti-Wear Characteristics: high grease retention assures proper gear protection for prolonged time.

Esso

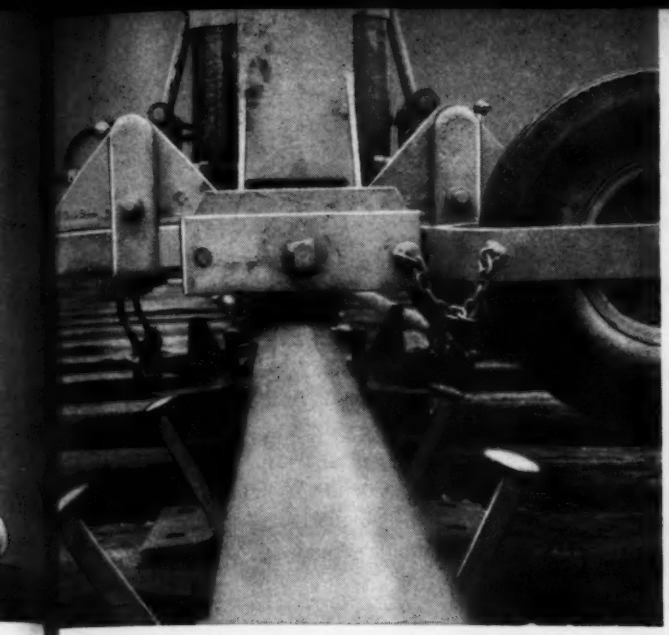
RAILROAD PRODUCTS



A spiking team—one man on a Racor Distributing Carriage places the spikes loosely in the line spike holes. Another man drives two spikes at once by operating the control handle of the DD4. Release of the control handle readies the Dual Driver for the next pair of spikes.

New Racor Dual Dri*cut*

The DD4 in action! All the advant
of a powerful pneumatic hammer,
man drives twice as many spikes wi
relief or fatigue. Costly hand setting
of spikes is eliminated.



The spikes are automatically picked up and held vertical for driving by the Dual Driver. The spikes may be leaned either toward or away from the rail as shown here.

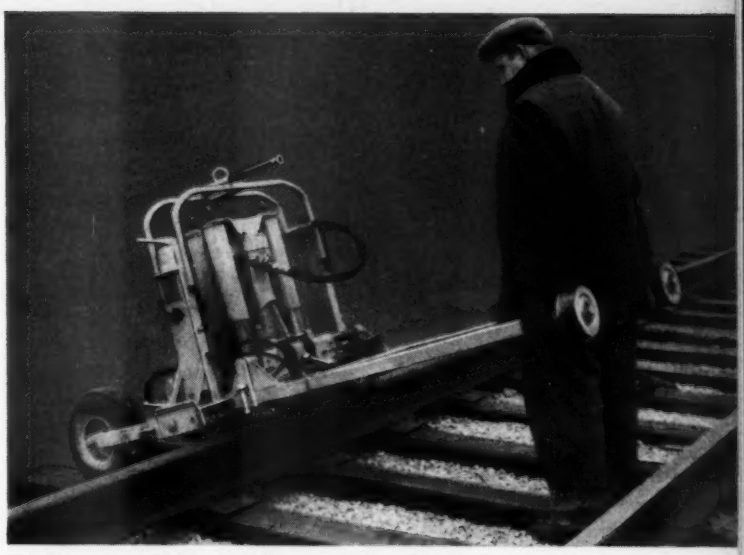
Dri*cuts line spiking costs!*

Actual experience on many miles of track has *proven* that the Racor Dual Driver DD4 effects substantial reduction in line spiking costs:

One man can easily drive at least twice as many spikes as any other spike driver. After spikes are distributed to the tie plate holes, the DD4 positions them for driving, drives two spikes at once, and automatically resets for the next pair of spikes.

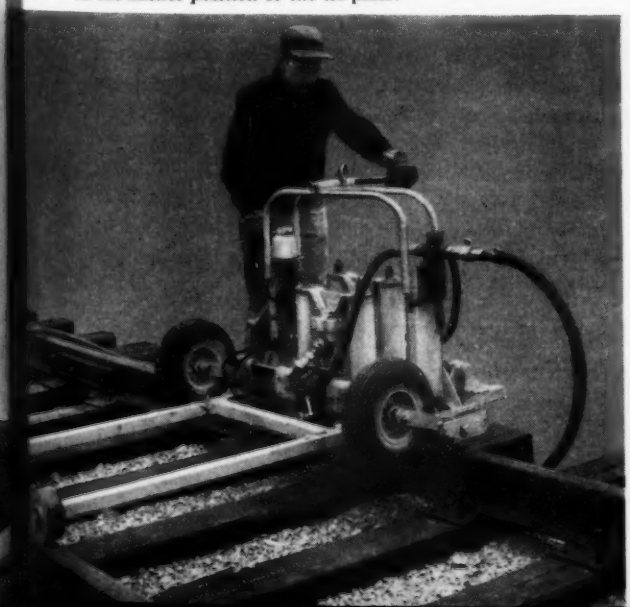
The DD4 can also drive Racor Studs!

Why not see how this new Racor Dual Driver can best fit into your own maintenance-of-way plans? Your Ramapo representative will be glad to consult with you about your road's specific conditions and requirements.



The Racor Dual Driver is easily removed from track.

Also drives Racor Studs! The Racor Dual Driver can quickly be adapted in the field for driving Racor Studs in the anchor position of the tie plate.



AMERICAN
Brake Shoe
COMPANY

RAILROAD PRODUCTS DIVISION
530 FIFTH AVENUE
NEW YORK 36, N.Y.

A-8237

RAILWAY
TRACK and STRUCTURES

Dear reader:

On "selling" your own forces

Whether the use of a new policy, method or machine is going to meet with success depends a great deal on the degree to which the men who actually use or apply it are convinced it is a good thing. Many manufacturers have long recognized the truth of this statement. For this reason they often take particular pains to convince the field forces of the merits of their products, not only as a part of their over-all sales activities but also after the sale has been made. The purpose, in the latter instance, is to help assure that their products will be used to best advantage and will, thereby, acquire a favorable reputation on the particular road.

The railroads can profit from the experience and thinking of the suppliers in this respect. There never was a time when revolutionary changes in methods and equipment were occurring at a faster pace than today. Organizations are being revamped, basic maintenance policies are undergoing fundamental changes, and new materials and machines are being introduced. All these changes have a common purpose—to reduce costs. But this purpose is not going to be fully achieved merely by establishing a new policy or purchasing a new machine; the policy has to be implemented in the field and the machine has to be used in a certain way to get the best results. Thus, the man in the field—the supervisor in charge of the work—becomes a key figure in determining whether the purpose of a decision made at the top is to be realized.

It is not sufficient merely to advise this supervisor that a decision has been made and is to be put into effect. He must be convinced, first, of the wisdom of the decision. Second, he must know why it was made. Third, he must be told, or shown, exactly how it is to be applied to get the desired results.

How can all these things be achieved? The first requisite, of course, is a realization of their importance on the part of the policy makers. Next is a system of adequate communication between the policy makers and the policy implementers in the field. Basically, this means doing what is necessary to take the supervisors into the confidence of the headquarters people and to give them a full explanation of the why and how of a decision.

Printed or typewritten instructions may be adequate in some cases, but not always. The requirements of many situations can only be served by a verbal explanation, either individually in the field or by arranging a meeting or a series of meetings. In fact, a number of large roads have adopted the practice in recent years of holding annual meetings of their supervisors at which new policies are reviewed and explained. This practice needs to be adopted on a wider scale.

The matter of verbal instruction or explanation is particularly important when equipment of radically new concepts is being put into service. Manufacturers frequently arrange demonstrations of their equipment for the benefit of key men from different roads. Why shouldn't railroads themselves hold demonstrations of new equipment for the benefit of their own people?

The average supervisor or foreman is eager to do a good job. But railroads will never capitalize fully on this eagerness until steps are taken to make available to the supervisor complete knowledge not only of what is to be done, but why and how.

MHD

New classification yard for Southern

CAT* WHEEL-TYPE TRACTORS MOVE 5 MILLION YARDS—FAST

At Atlanta, a new automatic retarder classification yard is taking shape for Southern Railway System. This is a large construction job, requiring the moving of approximately 5 million cubic yards of earth and rock. Caterpillar wheel-type Tractors are the backbone of the grading fleet doing the job.

Morrison-Knudsen Company, Inc., and Moss-Thornton Co., Inc., contractors for the job, have six DW21s, two DW20s, two D9s and a D8 at work. When the big job is finished this year, the new yard, which requires 85-foot cuts, will be 4½ miles long, one-half mile wide.

The big yellow units are making the earth fly. Averaging a round trip every six minutes on a one-half-mile haul, they are carrying an average payload of 16 yards. Material is clay, rock and sand.

Now the production of these big units has been increased even more. The DW21 (Series C) with its 300 HP (maximum output) Turbocharged engine is perfectly matched with its new No. 470 LOWBOWL Scraper. The lower, wider bowl design loads more earth faster with a capacity of 25 cu. yd. heaped, 18 cu. yd. struck. That means still better cycle time and bigger production. And you get the same efficient LOWBOWL design in the new No. 456 Scraper matched to the four-wheeled DW20.

Your Caterpillar Dealer has dependable equipment that can be used for practically all of your off-track work. He carries your parts inventory and gives you fast, efficient service around the clock. Have him demonstrate his high production equipment on your job. Call him today.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**NAME THE DATE...
YOUR DEALER
WILL DEMONSTRATE**

News about people

BURLINGTON—**T. D. Livingston,** senior instrumentman on the Lines West of the Missouri river, has been promoted to division engineer at Alliance, Neb., succeeding **H. P. Gillespie** who has been transferred to Lincoln, succeeding **J. L. Way,** retired.

CANADIAN NATIONAL—**W. B. Jackson,** district engineer of the Southern Ontario district at Toronto, has been promoted to general superintendent, Northern Ontario district, with headquarters at North Bay, Ont. **C. I. Biegler,** acting district engineer at Toronto, has been appointed district engineer of the Southern Ontario district at Toronto. **J. L. Cann,** district engineer at Vancouver, B.C., has been transferred to Montreal, succeeding **E. S. English.**

CENTRAL OF GEORGIA—**R. P. Johnson** has been named assistant superintendent—structures and materials with headquarters at Macon, Ga., succeeding **J. G. Watwood,** who has been named superintendent—structures and materials. Mr. Watwood succeeds **G. W. Benson,** who has been promoted to division engineer on the Macon division at Macon, succeeding **W. D. Rhoads,** retired. **Walter Burke,** track supervisor at Savannah, has retired. **Simon Fogarty, Jr.,** track supervisor at Millen, has been named acting division engineer at Savannah, due to the recent illness of **R. H. Gilkey.**

CHESAPEAKE & OHIO—**A. C. Trimble,** assistant supervisor of track at Walbridge, Ohio, has been promoted to supervisor of track at Presque Isle. **J. D. Newman** has been appointed resident engineer at Presque Isle.

DELAWARE & HUDSON—**Randolph J. D. Kelly,** assistant to the chief engineer, has been promoted to engineer maintenance of way, succeeding **Joseph C. Brennan,** whose appointment as superintendent of the Pennsylvania-Susquehanna division was recently announced. **Howard B. Clarkson,** engineer of structures at Albany, N. Y., has been named assistant to the chief engineer, succeeding Mr. Kelly. **John J. Connor,** special engineer in the chief engineer's office, has been named engineer of structures succeeding Mr. Clarkson.

ERIE—**W. D. Slater** has been named assistant division engineer on the Marion division at Huntington, Ind., succeeding **J. K. Weikal** who has been transferred to the Delaware-Susquehanna-Tioga and Wyoming divisions at Hornell, N. Y. Mr. Weikal succeeds **E. W. Scott** who has been transferred to the New York division at Jersey City, N. J.

GULF, MOBILE & OHIO—**Wallace H. Strumm** and **Robert Hellweg,** assistant division engineers at Bloomington, Ill., have been named regional engineer and assistant regional engineer, Northern region, respectively, at Bloomington.

LEHIGH VALLEY—**John E. Crowley,** assistant division engineer of the New York division at Wilkes-Barre, Pa., has been promoted to division superintendent at Buffalo, N. Y.

NEW YORK CENTRAL—**J. M. Gilmore,** assistant district engineer of structures at Indianapolis, Ind., has assumed the duties of **L. H. Schaeparklaus,** district engineer of structures, who retired recently. The position of district engineer of structures has been abolished. **Arthur Anderson,** special assistant engineer at Chicago, has been appointed engineer of grade crossings at that location. **George H. Tilson,** assistant designing engineer, has been named designing engineer at New York succeeding **Archibald D. Duffie,** retired. **Edgar S. Miller,** special engineer at New York, has been named assistant designing engineer, succeeding Mr. Tilson. **Milton H. Aldrich,** designer, has been named assistant engineer at New York, and **Roy G. Metcalf,** assistant engineer, has been appointed special engineer. **H. F. Bird,** district engineer of structures at New York, has been transferred to Syracuse, N. Y. **Harold W. Benson,** a clerk in the signal department at Springfield, Mass., has been named assistant engineer at Syracuse. **John F. Carney,** assistant chief clerk in the M/W department at Boston, has been named district supervisor of bridges and structures at Syracuse. **Bryan J. Murphy,** assistant engineer at Chicago, has been promoted to assistant division engineer at Columbus, Ohio. **Emory M. Anderson,** foreman at Dwight, Ill., has been promoted to supervisor of track at Kankakee, Ill. **Marion A. Motter,** bridge inspector at Cleveland, has been promoted to assistant supervisor of bridges and buildings at that location. **Stanley A. Swartz,** assistant supervisor of track at Englewood, Ill., has been promoted to assistant engineer, maintenance of way, at that location. **Walter G. Cosner,** assistant supervisor of track at Kentland, Ind., has been named supervisor of track at Jackson, Mich. **Robert H. Miller,** assistant methods and production engineer at East Rochester, N. Y., has been named methods and production engineer at Beech Grove, Ind.

SEABOARD AIR LINE—**H. L. Chancey,** assistant roadmaster at Savannah, Ga., has been promoted to roadmaster at Dillon, S. C., succeeding **G. W. Martin,** who has been transferred to Hamlet, N. C., succeeding **W. O. Allen,** who has been transferred to Jacksonville, Fla., succeeding **J. O. McCormick,** retired. **J. H. Jarrell,** assistant roadmaster at Jacksonville, has been transferred to Savannah, succeeding Mr. Chancey.

UNION PACIFIC—**R. M. Brown,** district engineer of the Western district at Salt Lake City, Utah, has been appointed to the newly created position of district engineer of the Northwestern district at Portland, Ore. **J. W. Godfrey,** division engineer at Cheyenne, Wyo., has been promoted to district engineer of the South-Central district at Salt Lake City. **W. R. Tyler,** division engineer at Kansas City, Mo., has been transferred to Cheyenne, succeeding Mr. Godfrey. **J. M. Bates,** division engineer at Los Angeles, has been transferred to Kansas City replacing Mr. Tyler. **F. G. Schurman,** assistant engineer at Omaha, Neb., has been promoted to division engineer at Los Angeles, succeeding Mr. Bates.

Biographical briefs

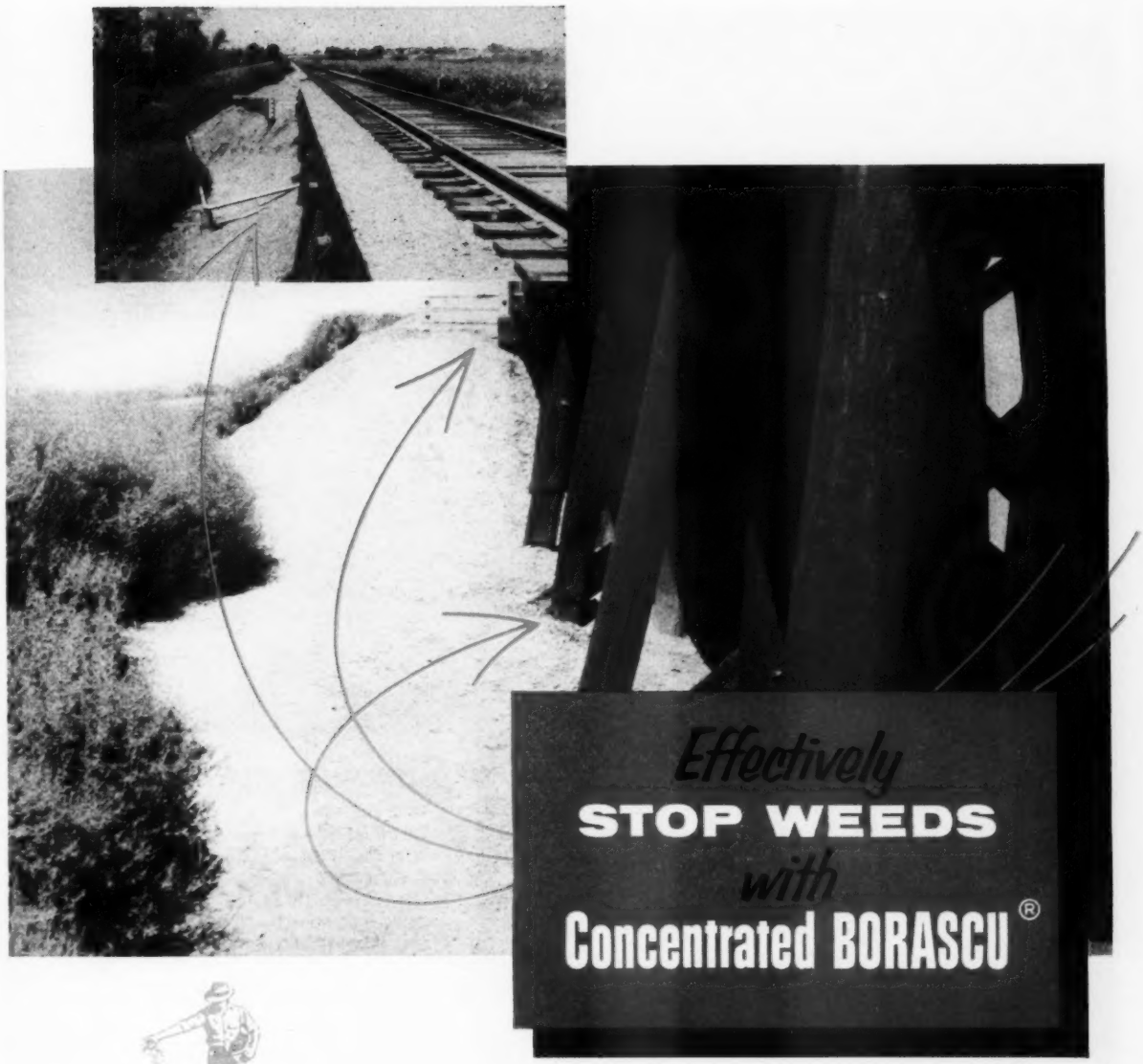
Harold C. Tunison, 53, whose promotion to vice-president and general manager of the Lehigh & New England at Bethlehem, Pa. was recently announced (*RT&S,* June, p. 24), graduated from Lafayette College and began railroading with the Lehigh Valley as a transitman and bridge draftsman in 1928. After serving with the Pennsylvania Department of Highways and the North Carolina Highway Commission, he rejoined the LV in 1936 as a bridge designer and later that year entered the service of the L&NE as a draftsman. In November 1937 he was appointed supervisor and on January 1, 1940, was named assistant engineer maintenance of way. He was appointed assistant chief engineer in December 1955 and on January 1, 1956, was promoted to chief engineer. On May 22, 1956, he was promoted to general manager—the position he held at the time of his recent promotion.

L. M. Poitevin, 39, whose promotion to district engineer on the Canadian National at Quebec City, Que., was recently announced (*RT&S,* July, p. 30), graduated from McGill University and joined the CNR in 1944 in the department of research and development. He subsequently served as instrumentman on the Cochran division, and assistant engineer on the Laurentian division and Quebec district until 1950 when he was promoted to division engineer on the Laurentian division. In 1954 he was transferred to the Levis

(*Continued on page* 102)

H. C. Tunison
L&NE

L. M. Poitevin
CNR



your best defense against weeds on tough terrain!

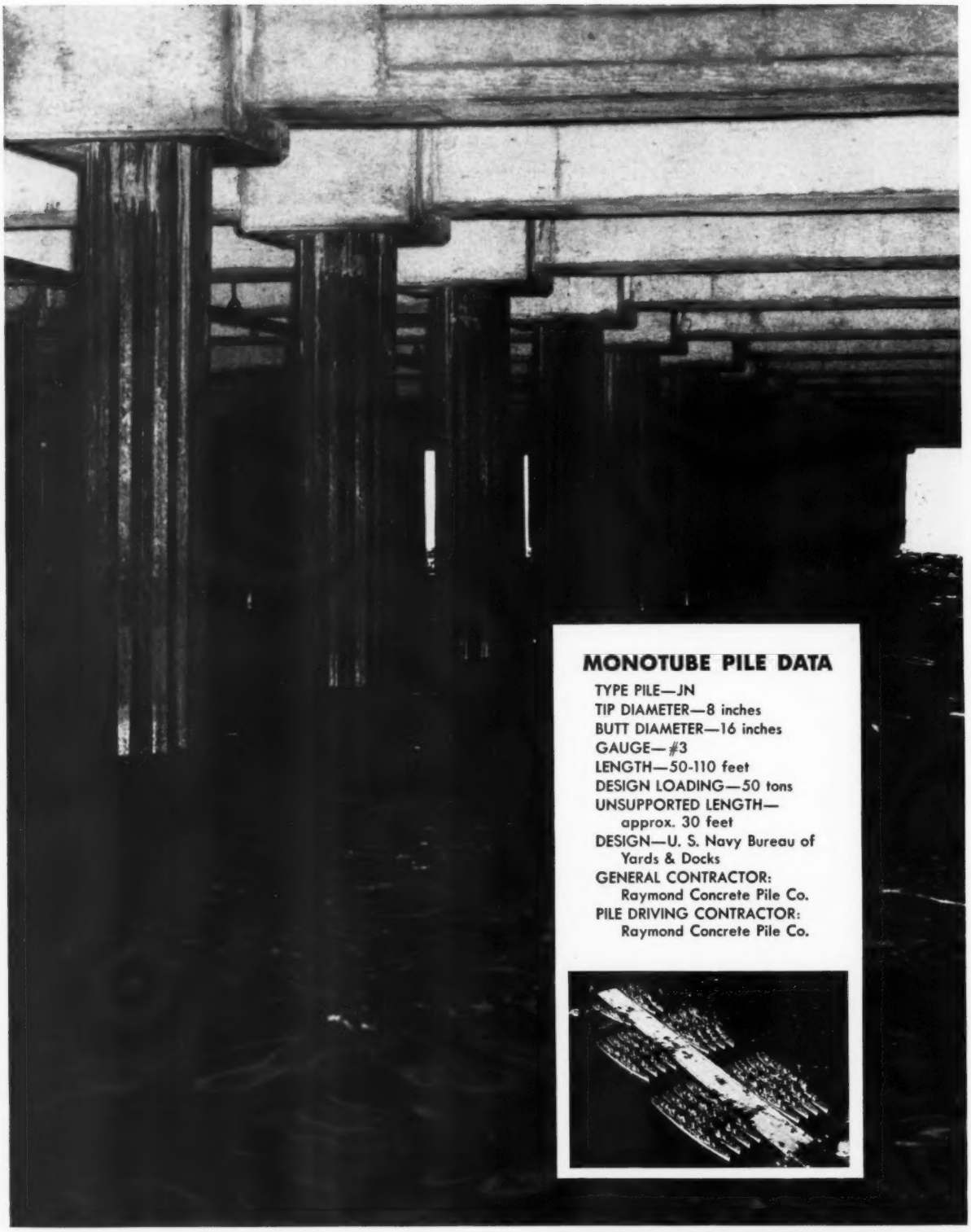
Protecting your timber structures from the fire hazard of weeds and grasses is simple and safe with Concentrated BORASCU. It kills vegetation and prevents regrowth with carry-over control which can last for a year or longer!

Applying Concentrated BORASCU is easy and inexpensive. Just a man with a pail can treat any type of terrain quickly. This granular borate material comes to you ready for use. There is nothing to mix—no water to haul!

Roads, big and small, from coast to coast are now using Concentrated BORASCU. They favor it for the safety, economy, effectiveness and convenience it offers. Your 'road, too, can benefit by using Concentrated BORASCU weed killer...write today for descriptive literature.

Check all these features:
- EASY TO APPLY... AND SAFE
- RESULTS THAT ARE LONG-LASTING
- NONSELECTIVE • NONPOISONOUS
- NON FIRE-HAZARDOUS
- NONCORROSIVE TO FERROUS METALS

AGRICULTURAL SALES DEPARTMENT
United States Borax & Chemical Corporation
PACIFIC COAST BORAX COMPANY DIVISION
630 SHATTO PLACE, LOS ANGELES 5, CALIFORNIA
MANUFACTURERS OF FAMOUS "20 MULE TEAM" PACKAGE PRODUCTS



MONOTUBE PILE DATA

TYPE PILE—JN
TIP DIAMETER—8 inches
BUTT DIAMETER—16 inches
GAUGE—#3
LENGTH—50-110 feet
DESIGN LOADING—50 tons
UNSUPPORTED LENGTH—
approx. 30 feet
DESIGN—U. S. Navy Bureau of
Yards & Docks
GENERAL CONTRACTOR:
Raymond Concrete Pile Co.
PILE DRIVING CONTRACTOR:
Raymond Concrete Pile Co.

STABILITY WITH MONOTUBES . . . ideal as piles with long unsupported lengths in pier work. In the construction of the 1,350-foot U.S. Navy berthing pier, Newport, R. I., piles in excess of 100 feet in length were driven in perfect alignment facilitated by the extreme rigidity of Monotubes.

Tapered, fluted Monotube piles are available in lengths, diameters and gauges to meet every requirement. Write The Union Metal Manufacturing Co., Canton 5, Ohio, for complete information.

UNION METAL

Monotube Foundation Piles

AUSTIN-WESTERN HYDRAULIC CRANE

Austin-Western hydraulic crane equipped with magnet and outriggers at work in storage yard of Riverside Foundry.

RIVERSIDE FOUNDRY REPORTS:

A-W pays for itself in yard operations, speeds many maintenance jobs

Riverside Foundry, at Bettendorf, Iowa, has a storage yard 2½ blocks long. For years two large crawler cranes with magnets operated in this yard, unloading scrap from freight cars and filling charging ladles a block away. They also were used for light lifting jobs in all parts of the yard, which necessitated a lot of travel time and expensive repairs.

A-W crane pays its own way. The A-W has taken over so many of these smaller jobs that Riverside says: "Savings in the yard will repay its cost over a 6-year period by lowering the maintenance cost on the two larger cranes, and the other services performed by it will be clear gain . . . Now the wear on the tracks of the larger cranes has been reduced to a minimum, and they can swing scrap from storage piles into the charging ladles without moving."

Maintenance jobs done much faster. For example: 750 kva transformer brought down from 20-ft. superstructure in ⅛th previous time; transformer can be filled with oil 6 times as fast; sand system screens changed 8 times as fast, at ⅛th cost; quench tanks cleaned, including scale, at a saving of more than $600 per year; changing motors on overhead cranes costs $750 less per year.

Get the complete Riverside Foundry story — Gould Certified Report No. 5702. Mail the coupon today.

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642 Farnsworth Avenue, Aurora, Ill.
Please send complete Gould Certified Report No. 5702.

Name .....
Title .....
Company .....
Street .....
City ..... Zone..... State .....

Power Graders • Motor Sweepers • Road Rollers • Hydraulic Cranes

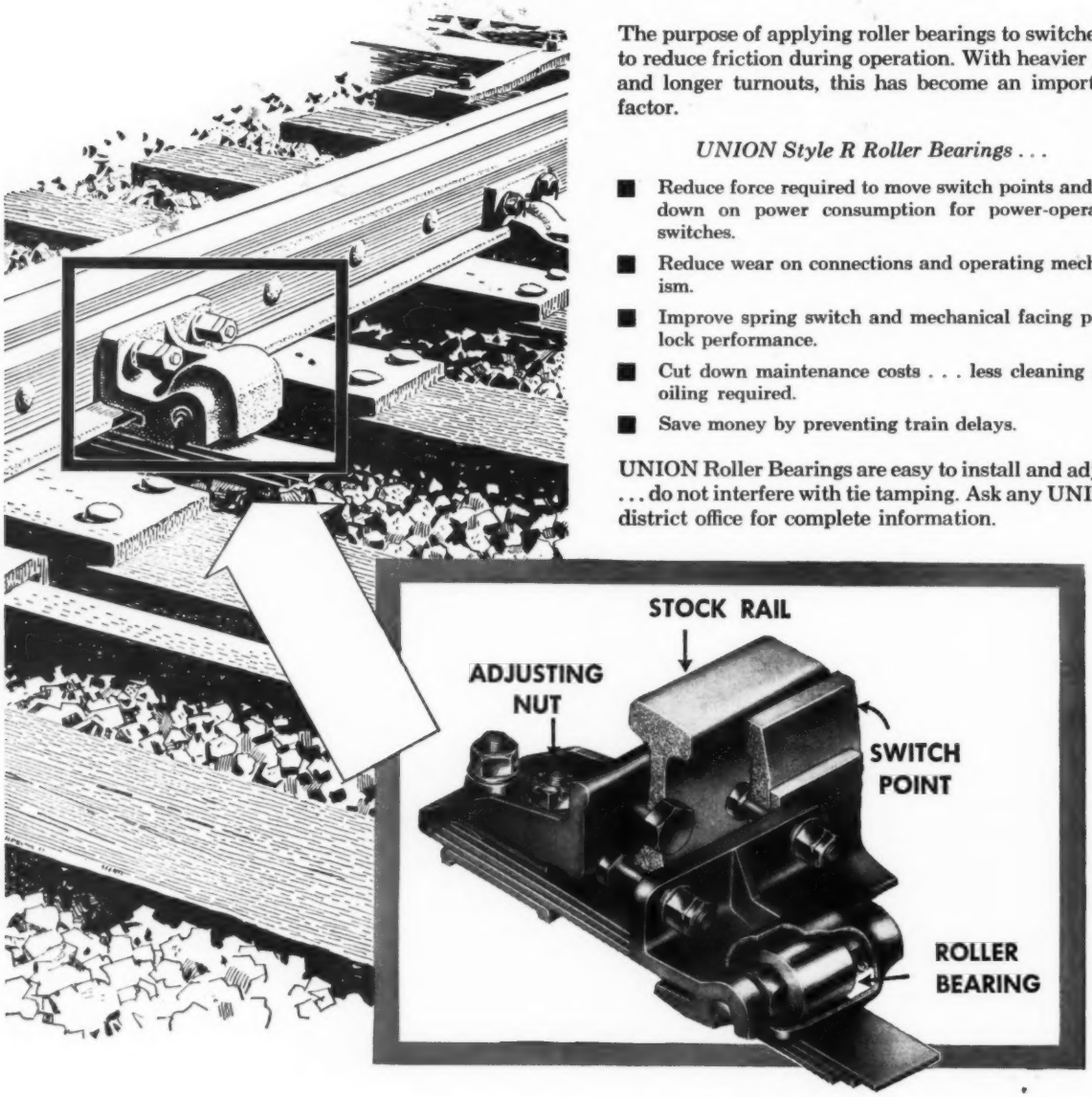
BALDWIN BLH LIMA-HAMILTON

AUSTIN-WESTERN WORKS
BALDWIN-LIMA-HAMILTON
Construction Equipment Division
OTHER DIVISIONS: Eddystone • Lima • Electronics & Instrumentation • Hamilton • Loewy-Hydropress • Standard Steel Works • Madsen • Pelton
AURORA, ILLINOIS, U.S.A.

UNION Roller Bearings give—

Increased reliability of switch operation under adverse conditions

Easier operation under all conditions



The purpose of applying roller bearings to switches is to reduce friction during operation. With heavier rail and longer turnouts, this has become an important factor.

UNION Style R Roller Bearings . . .

- Reduce force required to move switch points and cut down on power consumption for power-operated switches.
- Reduce wear on connections and operating mechanism.
- Improve spring switch and mechanical facing point lock performance.
- Cut down maintenance costs . . . less cleaning and oiling required.
- Save money by preventing train delays.

UNION Roller Bearings are easy to install and adjust . . . do not interfere with tie tamping. Ask any UNION district office for complete information.

UNION SWITCH & SIGNAL
DIVISION OF WESTINGHOUSE AIR BRAKE COMPANY
SWISSVALE, PENNSYLVANIA

NEW YORK.....PITTSBURGH.....CHICAGO.....SAN FRANCISCO

RAILWAY
TRACK and STRUCTURES

News notes...

. . . a resumè of current events throughout the railroad world

In the first six months of 1956, Class I railroads had a net income of roughly $345 million. This year, however, the first six months have brought in a net of only $286 million—$59 million below last year. Net operating income, too, declined in comparison with the first six months of '56: some $450 million this year, as against about $512 million. Total operating revenue for this period was within one tenth of one per cent of the total for the same period last year, while operating expenses climbed 1.8 per cent. Gross capital expenditures this year jumped 14.3 per cent over 1956 with roadway expenditures currently running close to $428 million for 112 Class I roads.

●

Daniel P. Loomis, new president of the Association of American Railroads, has been succeeded as president of the Association of Western Railways by C. M. Roddewig, president of the C&EI. David O. Matthews, vice-president and general counsel, has been elected president of the C&EI, succeeding Mr. Roddewig.

●

William T. Faricy, chairman of the AAR, referring recently to the 3.69 per cent return averaged on their investment by Class I roads for the year ending June 30, pointed out that a general rate increase plus a big boost in freight traffic would be needed before railroads could feasibly borrow money at interest rates of from 4½ to 6 per cent to buy equipment. Should the rate of return reach 5 per cent, he said, ". . . we could do an awfully good job of getting more freight cars." Regarding the Eastern roads' "Rail Cars for Progress and Defense" plan, he noted that the AAR was not in a position to evaluate it, but added that "no one in the railroad industry opposes the plan."

●

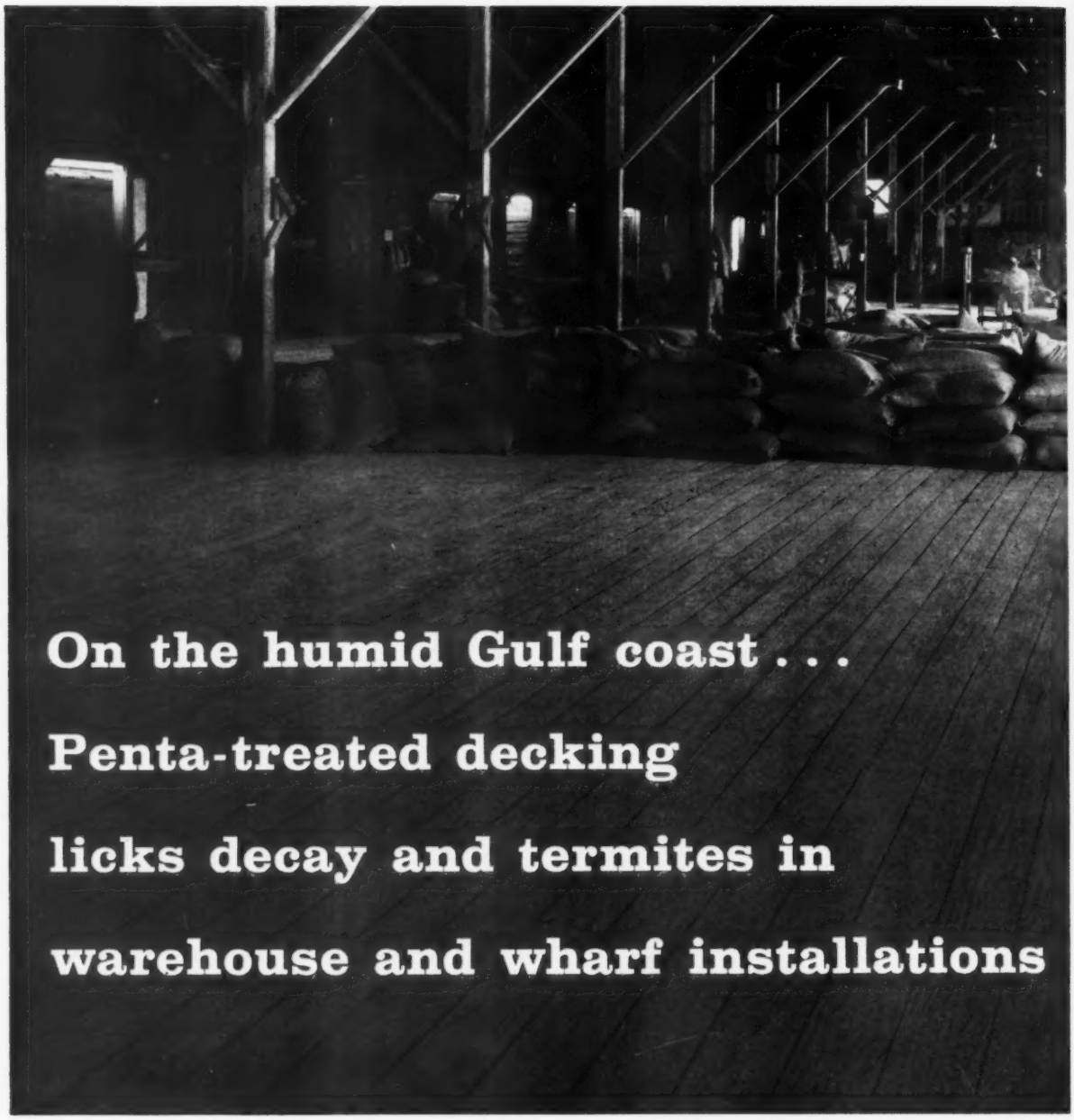
The Interstate Commerce Commission has served notice that it is proposing to extend the scope of its safety rules for the purpose of giving effect to a recent decision of the United States Supreme Court that track motor cars and push trucks when coupled together are vehicles subject to the provisions of the Safety Appliance Act. The notice gave interested parties until November 1 to file statements of their views, including requests for oral argument.

●

Railroad freight revenues will get a $443 million shot in the arm as a result of the ICC's August 6 decision on the Ex Parte 206 case. The authorized advance in freight rates totals up, however, some $700 million short of what the railroads had requested. "We believe," the ICC report stated, "that the railroads must look primarily to technological advances in the art of railroading to achieve greater efficiency and improved service as a major hope for increasing their rate of return."

●

Following the ICC's decision in the freight-rate case, B&O President Howard E. Simpson pointed out that another rate hike request, perhaps before the end of the year, may well be "imperative." The railroads will be forced to go back to the commission for more, said Mr. Simpson, "if we are to do all the things we should do in purchasing equipment and improving general overall railroad operations in order to provide improved service and reduce costs."



On the humid Gulf coast . . . Penta-treated decking licks decay and termites in warehouse and wharf installations

(photo, courtesy of Texas & New Orleans R. R.)

1955—184,012 board feet of clean Penta-treated decking installed in Gretna Wharves, Gretna, Louisiana.

1957—Report: "Penta-treated material gives lasting protection against decay and insect attack. The treatment is clean enough so as not to contaminate bagged goods such as raw sugar . . ."

Here's the severest test any treated wood will have to meet. In the warm, humid Gulf coast area, wood decay and termites thrive in abundance. But termite-proof, rot-resistant Penta-treated wood, that stays sound for 30 years or longer, is meeting this test head on . . . saving many hundreds of dollars in repairs, replacements and the expense of a more costly installation . . . same as it will for you.

Easier, faster handling because it's clean. Oil-borne, *not water soluble*, Penta solution doesn't bleed out of wood to irritate and slow down workmen, stain cargoes or leave wood vulnerable to attack.

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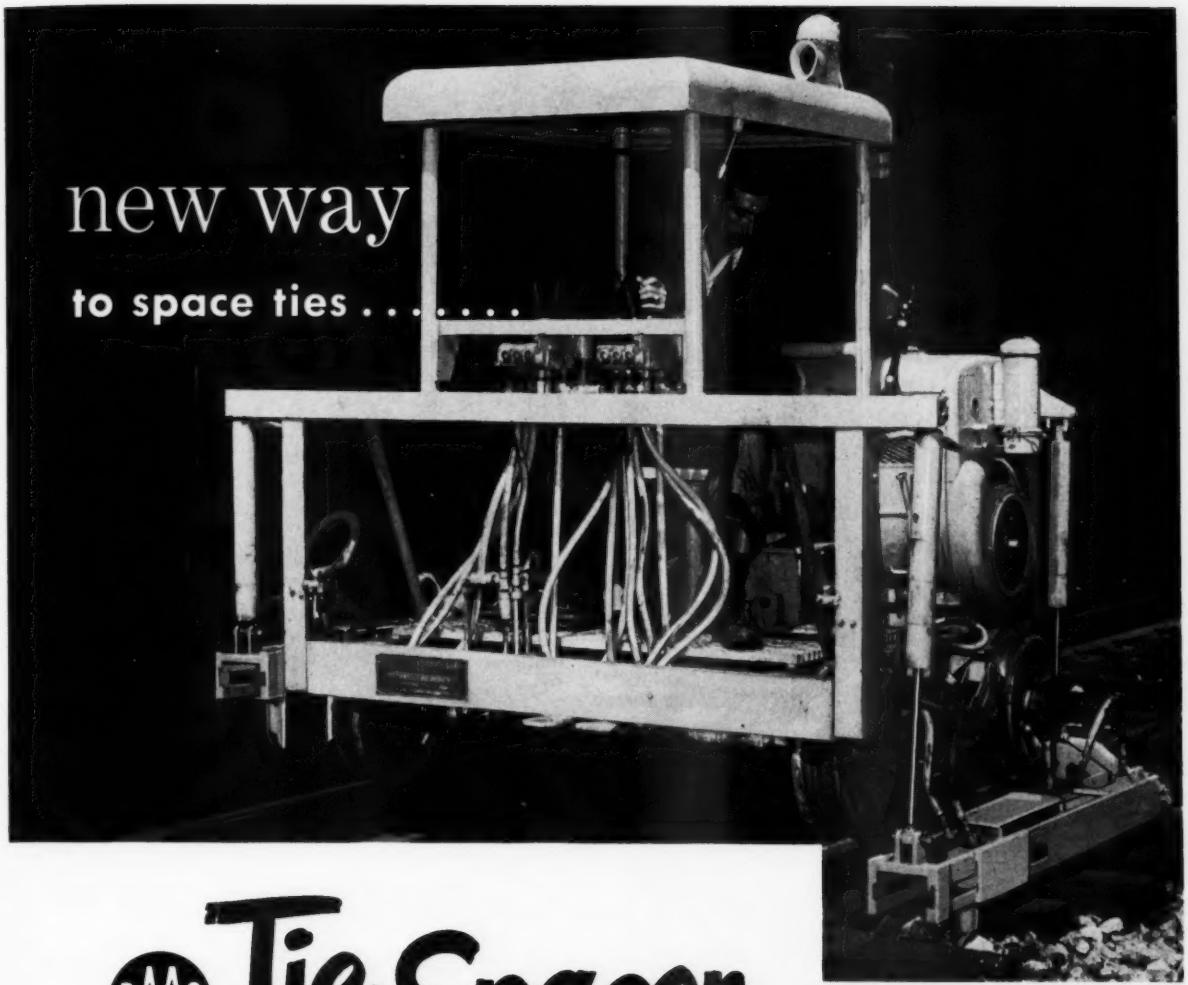
MONSANTO CHEMICAL COMPANY
Dept. PI-19A, St. Louis 1, Missouri

MONSANTO®

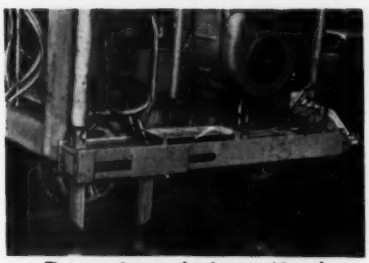
Where Creative Chemistry Works Wonders for You



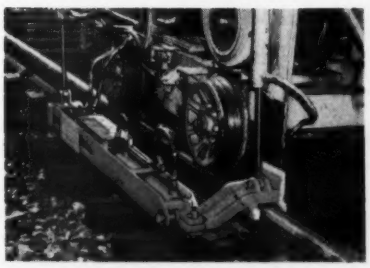
RMC Tie Spacer

Hydraulic shifting devices on both sides of machine may be used independently or together to correct poor spacing and slewed tie conditions. Ties can be moved in either direction parallel to the rail. Shifting devices automatically clamp to the rail when lowered to operating position, taking all forces through the anchorage.

Ask for Bulletin TS-100.



Tie engaging mechanism positioned over tie to be moved.



Shifting device lowered to operating position, with clamp automatically positioned on rail.

Railway Maintenance Corporation

PITTSBURGH 30, PA.

PRI MEMBER

Trial and LEASE Plans

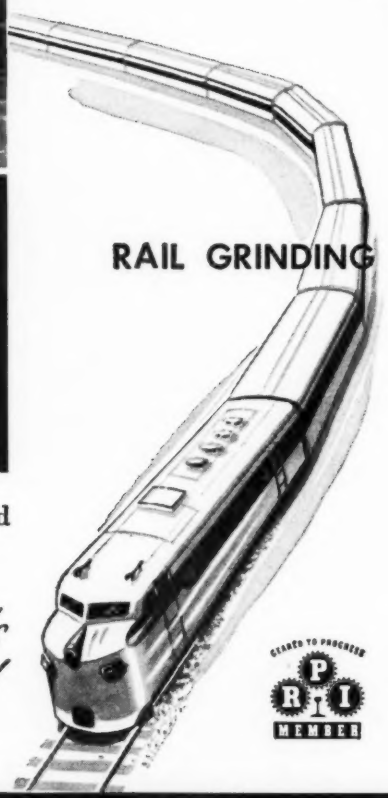
SPENO REPORT OF A DECADE OF PROGRESS

BALLAST CLEANING

1947	1948	1949	1950	1951	1952	1953	1954	1955	1956
DL&W	DL&W	DL&W	DL&W	DL&W	DL&W	DL&W	DL&W	DL&W	DL&W
PRR	PRR	PRR	PRR	PRR	PRR	PRR	PRR	PRR	PRR
SOU.Ry	SOU.Ry	SOU.Ry	SOU.Ry	SOU.Ry	SOU.Ry	SOU.Ry	SOU.Ry	SOU.Ry	SOU.Ry
B&MRR	B&MRR								
CRRNJ	CRRNJ	CRRNJ		CRRNJ		CRRNJ		CRRNJ	
CNO&TP	CNO&TP	CNO&TP	CNO&TP	CNO&TP	CNO&TP	CNO&TP	CNO&TP	CNO&TP	CNO&TP
The D&H								The D&H	The D&H
	IC				IC	IC	IC	IC	IC
			C&O	C&O	C&O	C&O	C&O	C&O	C&O
			P-RSL	P-RSL					
					NYCRR	NYCRR	NYCRR	NYCRR	NYCRR
					CNRys	CNRys	CNRys	CNRys	CNRys
					CPRy	CPRy	CPRy		
					RDG	RDG		RDG	RDG
					ACL	ACL	ACL	ACL	ACL
						NKP			
						AGSRR	AGSRR	AGSRR	AGSRR
						CCC&STL	CCC&STL	CCC&STL	CCC&STL
						IHBRR	IHBRR	IHBRR	
							B&OCT	B&OCT	B&OCT
							B&ARR	B&ARR	B&ARR
								B&O	B&O
								P&LE	P&LE
									Erie
									CB&QRR
									N&WRy
									MCRR

RAIL GRINDING

1955	1956
Erie	Erie
DL&W	DL&W
LV	LV
The D&H	The D&H
B&O	B&O
C&O	
	DT&I
	PRR
	NKP
	WMRy
	IC



The repeat business which we have enjoyed through the years proves the value of our service and prompts our slogan:

Just Ask the Railroads That have used us!

SPENO

GEARED TO PROGRESS
P R I
MEMBER

FRANK SPENO RAILROAD BALLAST CLEANING CO., INC.

306 North Cayuga St., Ithaca, N. Y.

"Why didn't somebody tell me that Bird Self-Sealing Tie Pads could save $4.13 per cross tie?"

Perhaps you, too, need proof of how Bird Self-Sealing Tie Pads save you $4.13 per cross tie. Here are the facts:

The average installed cost of a new main line cross tie is approximately $7.00*. With a normal life of 20 years, this amounts to 35¢ per year.

Bird Self-Sealing Tie Pads increase the life of the average tie by at least 15 years. (This has been proved repeatedly by actual in-track installations.) At 35¢ per year, this saving amounts to $5.25 per tie.

The approximate cost of obtaining this saving is $1.12 — for two five-ply 7¾" x 12" Bird Self-Sealing Tie Pads. This gives you a *net saving of $4.13 per tie.*

Bird Self-Sealing Tie Pads are the *only* tie pads whose durable and effective seal with the tie has been proved through years of in-track service. For complete information, write Bird Tie Pads, Department HTS, East Walpole, Massachusetts.

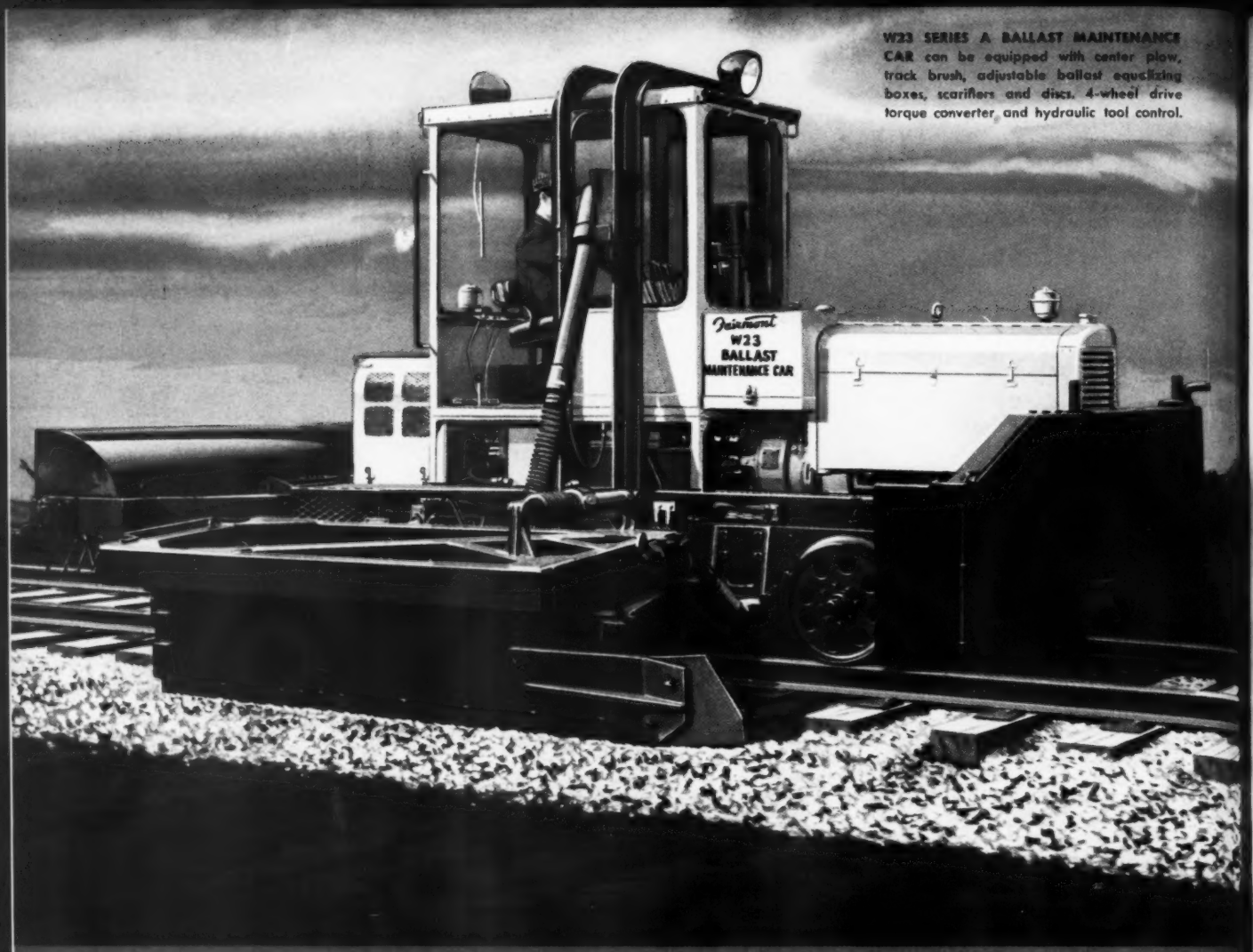
*These figures represent the most conservative minimum. If your costs are higher, savings are proportionately higher.

Bird Self-Sealing Tie Pads Are Recommended For:

Bridge Decks • Curves • Switch Timbers • Highway Grade Crossings and Other Paved Areas • Crossing Frogs • Insulated Joints • With Smaller Tie Plates • Pile Cutoffs • Through Station Platforms • Out-of-Face Installations in Rail-Laying Programs • Locations where tie life is short or replacement costs are high.

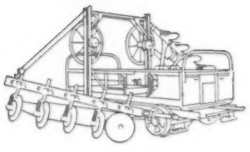
Buy the Best . . . BIRD & SON inc. Established 1795 *Buy BIRD*

BIRD SELF-SEALING TIE PAD AFTER 5 YEARS SERVICE is removed for inspection. Pad had to be pried from tie owing to tenacious seal that is characteristic of all Bird Tie Pads. Reapplied, and becoming resealed after inspection, the Bird Tie Pad is good for many additional years of protective service.

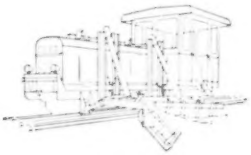


W23 SERIES A BALLAST MAINTENANCE CAR can be equipped with center plow, track brush, adjustable ballast equalizing boxes, scarifiers and discs. 4-wheel drive torque converter and hydraulic tool control.

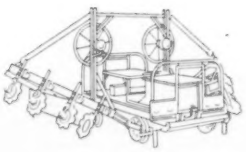
When you think of
BALLAST MAINTENANCE
. . . think first of **Fairmont**



W62 SERIES C BALLAST DISCER reworks shoulder ballast, improves drainage and appearance, reshapes shoulders. Has six-cylinder engine.



W77 SERIES A BALLAST MAINTENANCE CAR can mount center plow, ballast equalizing boxes, scarifiers, discs, and two sizes of blades. Has four-wheel propeller shaft drive and hydraulic tool control.



M25 SERIES D BALLAST DISCER loosens shoulder ballast for better drainage, reshapes them for improved appearance. Engine has four cylinders.

Economical maintenance of track ballast demands the use of the most productive and time-saving machines. That is why more and more supervisors are using the Fairmont equipment shown on this page. These units are well able to perform a wide variety of necessary jobs in the shortest possible time. To obtain greater speed and efficiency . . . easy, thorough operation . . . and economical, sturdy equipment for your ballast maintenance operations, call on Fairmont.

FAIRMONT RAILWAY MOTORS, INC., FAIRMONT, MINN.

MANUFACTURERS OF BALLAST MAINTENANCE CARS, DERRICK CARS, OIL SPRAY CARS, GROUTING OUTFITS, TIE RENEWAL EQUIPMENT, RAIL RENEWAL EQUIPMENT, WEED CONTROL EQUIPMENT, HY-RAIL CARS, TRACK MOTOR CARS, PUSH CARS AND TRAILERS.

RAILWAY
TRACK and STRUCTURES

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DON'T MISS . . .

The LeRoi-Westinghouse Tractair is normally a ground-traveling machine, but there are some locations where the unit cannot be driven along the right of way or over farmers' lanes to the job sites. To enable this machine to reach all track locations, the North Western is equipping its units with retractable flanged-wheel attachments.

. . . in the October issue

Allis-Chalmers brings you another new measure of cost-cutting performance . . .

3 Motor Scrapers—9.5, 14 and 20 cu yd heaped
2 Motor Wagons—15-cu yd rock wagon and 22-cu yd bottom dump (heaped

The TS-160 Motor Scraper

The versatile TS-160 is the latest addition to the Allis-Chalmers line of advanced-design construction machinery. This new one-man dirt mover offers economical, high-speed performance whether working alone or in a fleet. It does a big job at minimum cost on many off-track assignments. For example, the TS-160 can be used to spread ballast, slope banks, build sidings, widen roadbeds, raise grades, build rights-of-way, and speed many other types of earth-moving jobs.

Measure these TS-160 advantages for your particular construction needs:

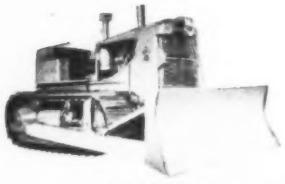
22 hp per struck yd—Big Allis-Chalmers supercharged diesel engine delivers extra lugging ability for tough pulls, fast loading. The versatile TS-160 handles a wide range of construction and maintenance jobs, travels at speeds up to 25.4 mph.

Moves quickly from job to job . . . when required transport wheels are available to meet legal limits for highway travel.

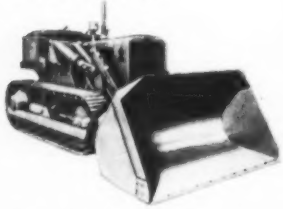
Turns non-stop in less than 25 ft with 90-degree hydraulic steering . . . . easy maneuverability in narrow cuts, faster cycles without reversing in tight turn-arounds.

See your Allis-Chalmers dealer . . . let his railroad representative show you the TS-160 in action. Ask him about the complete line of Allis-Chalmers construction equipment.

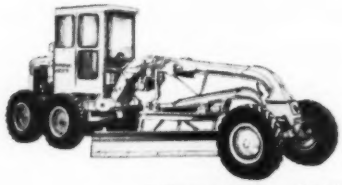
Allis-Chalmers, Transportation Sales Dept., Milwaukee 1, Wisconsin



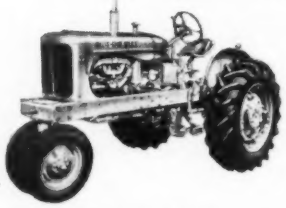
4 Crawler Tractors—52 drawbar to 204 net engine hp



4 Tractor Shovels—1½ to 4-cu yd standard buckets



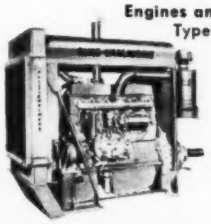
2 Motor Graders—120-brake hp Forty Five, 50-brake hp Model D



3 Wheel Tractors with attachments—22.8 to 45.3 belt hp

Fork Lift Trucks—Capacities 2,000 to 8,000 lb; diesel, LP gas or gasoline—attachments to fit the job

Engines and Generating Se
Types for any power
9 to 516 hp;
gasoline, n
or LP



ALLIS-CHALMERS *Engineering in Action*

RAILWAY TRACK and STRUCTURES

J. E. Griffith
President
Roadmasters' Association

R. R. Gunderson
President
Bridge & Building Assn.

It's Convention Month

Annual meetings of the Roadmaster's and Maintenance of Way Association and the American Railway Bridge and Building Association will be held concurrently at the Conrad Hilton Hotel, Chicago, September 23 to 25, inclusive.

What supply associations are doing

Although this is a non-exhibit year the Track Supply Association and the Bridge and Building Supply Association are very much in the picture. Working in close cooperation with each other, the Executive Committees of the two associations have approved plans for the annual banquet to be held on September 24 for the members and families of the Roadmaster's and B&B Associations. With the interests of their railroad guests in mind they are introducing an innovation this year to eliminate the congestion and last-minute rush incident to the seating of guests at the banquet. This problem will be solved by a plan for assigning tables in advance.

While thus dealing with current matters, the associations have also been looking ahead to 1959 when they will sponsor their next exhibit at the Coliseum in connection with the Roadmasters' and B&B conventions. With a successful exhibit as the objective, membership activities are being maintained and the organizations generally are being kept at a high rate of efficiency.

A. J. Reading
President
Track Supply Assn.

R. E. Mann
President
B&B Supply Assn.

Highlights of the programs

- **Addresses by top railway officers on current problems of the railway industry, with emphasis on what supervisors can do about them. The speakers: D. W. Brosnan, operating vice-president of the Southern, and W. A. Grotz, president of the Western Maryland. Both addresses will be heard during joint sessions of the two associations. These messages should be of vital interest to every maintenance of way and structures supervisor.**

- **Other addresses on matters of direct interest to track and B&B men. Sample subjects: How research helps you; how to cope with the "unseen labor force;" how to achieve "total" B&B mechanization. Also, a "question-and-answer" period at which every supervisor will have a chance to pop questions that are perplexing him and to help others with their problems. This could be the top feature of the meetings but will require the cooperation of everyone present.**

- **The usual technical reports, prepared by special committees, on subjects that are currently in the limelight. (All copies of this issue distributed at the convention will have preprints of the committee reports bound inside the front and back covers.) In addition, the roadmasters will hear reports of their three standing committees. All reports should be of unusual interest this year because of the rapid changes taking place today.**

- **Other special features, including the annual banquet sponsored by the Track Supply Association and the Bridge and Building Supply Association. This affair will feature a top-talent floor show. As the final activity, there will be a joint inspection trip to the AAR Central Research Laboratory in Chicago. By means of guided tours the members will see how tests are made on track and B&B materials. For the ladies there'll be a bus trip to a point of outstanding interest.**

For details see complete program →

CONVENTION PROGRAMS

Roadmasters' and Maintenance of Way Association
American Railway Bridge and Building Association
Conrad Hilton Hotel, Chicago, September 23-25, 1957

(All sessions Chicago daylight saving time)

MONDAY MORNING, September 23

JOINT SESSION

Williford Ballroom

10:00 a.m.— Invocation by Dr. Kenneth Hildebrand, pastor, Central Church
Welcome by presidents of Roadmasters' and B&B associations
Greetings from Ray McBrian, president of American Railway Engineering Association
Greetings from President A. J. Reading of Track Supply Association
Greetings from President R. E. Mann of Bridge & Building Supply Association

10:30 a.m.—Address on Facing the Facts, by D. W. Brosnan, vice-president, operation, Southern, Washington, D. C.

11:00 a.m.—Address on How Research Helps Track and B&B Men, by G. M. Magee, director engineering research, AAR, Chicago

MONDAY AFTERNOON, September 23

ROADMASTERS' SESSION

Williford Ballroom

2:00 p.m.— Address by President J. E. Griffith

2:15 p.m.—Recognition of past presidents by W. M. S. Dunn

2:30 p.m.—Report of Committee on Training Personnel, Including Roadmasters or Supervisors, Foremen and Machine Operators—J. E. Shaw, chairman (roadmaster, Texas & New Orleans, Houston, Tex.)

3:15 p.m.— Report of Committee on Spot Surfacing or Smoothing—T. L. Kanan, chairman (assistant engineer track, Colorado & Southern, Denver, Colo.)

4:00 p.m.—Report of Standing Committee No. 3—Roadway—F. H. McKonney, chairman (engineer track, Chicago, Burlington & Quincy, Chicago)

4:30 p.m.—Adjourn

BRIDGE & BUILDING SESSION

Beverly Room

2:00 p.m.—Address by President Roy R. Gunderson

2:15 p.m.—Recognition of past presidents

2:30 p.m.—Report of Committee on Let the Motto Be: Always Safety First—R. D. Hellweg, chairman (assistant regional engineer, Gulf, Mobile & Ohio, Bloomington, Ill.)

3:00 p.m.—Report of Committee on Mechanization, Tools and Equipment—H. O. Adkins, chairman (general supervisor water service, Denver & Rio Grande Western, Denver, Colo.)

3:30 p.m.—Address on Blueprint for Total B&B Mechanization by W. E. Chapman, chief engineer—maintenance, Central of Georgia, Savannah, Ga.

4:00 p.m.—Moving picture on B&B mechanization, narrated by R. L. Fox, process engineer, structures, Southern, Washington, D. C.

4:30 p.m.—Adjourn

TUESDAY MORNING, September 24

ROADMASTERS' SESSION

Williford Ballroom

9:30 a.m.—Report of Committee on Radio Communication for Maintenance of Way Forces—W. E. Chapman, chairman (chief engineer, maintenance, Central of Georgia, Savannah, Ga.)

10:05 a.m.—Report of Committee on Advantages of Close Cooperation Between the Transportation Department and the Maintenance-of-Way Department—R. D. White, chairman (assistant division engineer, Frisco, Chaffee, Mo.)

11:15 a.m.—Report of Standing Committee No. 2—Track—F. L. Etchison, chairman (chief engineer, Western Maryland, Baltimore, Md.)

12:00 noon—Adjourn

BRIDGE & BUILDING SESSION

Beverly Room

9:30 a.m.—Report of Committee on Maintenance of Automotive and Maintenance-of-Way Equipment—E. F. Garland, chairman (bridge supervisor, New Orleans Public Belt, New Orleans, La.)

10:15 a.m.—Report of Committee on Utilities of Ready-Mix, Precast and Prestressed Concrete in B&B Work—F. D. Day, chairman (engineer structures, Pennsylvania, New York)

11:00 a.m.—Address on Problems in Maintenance of Motion Weighing Track Scales by J. N. Todd, engineer consultant, Cox & Stevens Electronic Scale Division, Revere Corporation of America, Wallingford, Conn.

12:00 noon—Adjourn

TUESDAY AFTERNOON, September 24

JOINT SESSION

Williford Ballroom

2:00 p.m.—Address on "Horsepower and Horse Sense," by W. A. Grotz, president, Western Maryland, Baltimore, Md.

2:30 p.m —Address on "The Unseen Labor Force and What You Can Do About It," by Donald M. Smith, regional director, Railroad Retirement Board, Chicago

3:00 p.m.—Questions and Answers—Moderated by E. L. Anderson, assistant to vice-president-operation, Frisco, St. Louis, Mo.

3:50 p.m.—Announcement regarding trip to AAR research laboratories

4:00 p.m.—Adjourn

TUESDAY EVENING, September 24

Grand Ballroom—Informal

6:30 p.m.—Joint annual banquet of the Roadmasters' and Bridge & Building Associations—with the supply associations

WEDNESDAY MORNING, September 25

ROADMASTERS' SESSION

Williford Ballroom

9:30 a.m.—Report of Committee on Methods of Transportation of Work Equipment—H. E. Hurst, chairman (division engineer, Milwaukee Road, LaCrosse, Wis.)

10:05 a.m.—Report of Standing Committee No. 1—Machinery for M/W Work—G. D. Mayor, chairman (division engineer, Chesapeake & Ohio, Huntington, W. Va.)

10:45 a.m.—Business session
Election and installation of officers

11:45 a.m.—Adjourn

BRIDGE & BUILDING SESSION

Beverly Room

9:30 a.m.—Report of Committee on Branch Line Bridges and Buildings and Their Maintenance—W. F. Petteys, chairman (division engineer, Erie, Hornell, N. Y.)

10:05 a.m.—Report of Committee on What Should the Supervisor Expect from Management and Vice-Versa?—N. H. Williams, chairman (division engineer, Delaware & Hudson, Oneonta, N. Y.)

10:40 a.m.—Business session
Election and installation of officers

11:45 a.m.—Adjourn

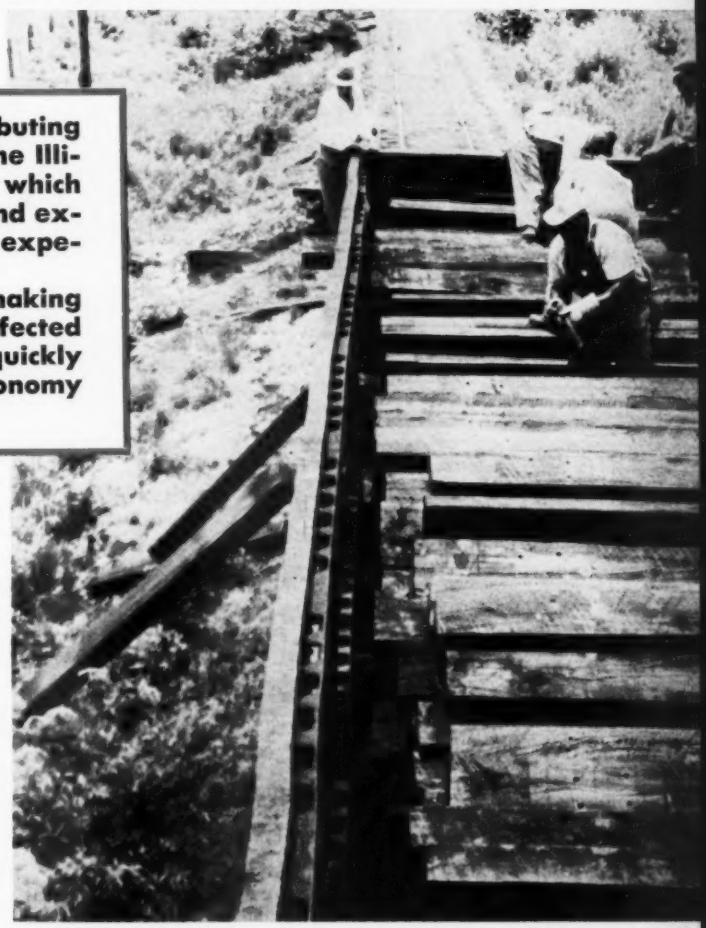
WEDNESDAY AFTERNOON, September 25

1:30-5:00 p.m.—Inspection trip to AAR research laboratories. Details to be announced during separate and joint sessions of associations.

Cuts tie costs with special car

Convinced that a special car for distributing ties would produce substantial savings, the Illinois Central took a high-side gondola car, which had been retired from revenue service, and experimented with it to develop a design for expediting this work.

After trying several designs and making numerous trial runs, the road now has perfected a car that enables ties to be unloaded quickly close to their points of use with greater economy and less hazard than before.



FALLING at right angles to the track, the ties usually stay where they land instead of rolling down the embankment.

See how it is built and used

How it was developed

● With its tie renewals running about 800,000 crossties annually, the Illinois Central decided that substantial savings could be made if even a small portion of the overall renewal cost could be reduced. In reviewing its tie-installation practices, the road found that one of the most promising ways of effecting immediate savings lay in the distribution of crossties.

Like many roads, the IC had been loading its new ties in high-side gondolas at tie-treating plants and unloading them in piles in station grounds or along the right of way. The ties were then handled a second time by loading them onto push cars, towing them by a motor car and unloading at the point of use. In recent years, a minor but increasing portion of the annual tie requirements were unloaded from work trains at the points of use, or sometimes from local freight trains.

Experiments were made with other methods of distribution. Half-tramload lots of crossties were formed into bundles at the treating plant by encircling them with steel strapping. The bundles were loaded by a crane into gondola cars, placed transverse to the car length, and unloaded later onto the ground from a work train by another crane. However, this method necessitated breaking the ties out of the bundles and distributing them at the point of use. The road decided there was little economy in this method.

Later, the same bundle procedure was followed on a tramload-lot basis but, instead of unloading the bundles on the ground, they were transferred to a flat car equipped with end stakes, from which they were distributed. While the trackmen found it much easier and quicker to distribute ties from a flat car, such cars are too much in demand for revenue service to tie them up for tie distribution.

Noting the success which a few roads have had in reducing tie-distribution costs using special cars, the track department undertook studies aimed at the development of a special tie car. Experiments were then started with a high-side, 50-ton capacity gondola, 41 ft long to determine the best design. Since crossties have a tendency to roll down the side of an embankment when dropped parallel with the track from a car, it was decided to design the new tie-distribution car so that the ties could be slid ends out of the car sides.

The sideboards of the car were removed, leaving only the top and bottom steel angles and the side steel uprights and diagonals in place. However, since the car was to be used to haul ties for a considerable distance from the treating plant, it was recognized that some means was needed to prevent the ties from being jostled out of the sides while the car was in transit.

The first design for this purpose contemplated using several removable horizontal steel slats while the car was in transit, which could be removed just prior to unloading. Small steel angles, having slots cut into the projecting legs to form hangers for the slats, were welded to each upright. Each slat was made long enough to span two openings between the uprights and the slats were spaced one above the other so as to be on a plane for each tier of ties piled in the car.

When the conversion work had been completed at the

Tests show that f bo

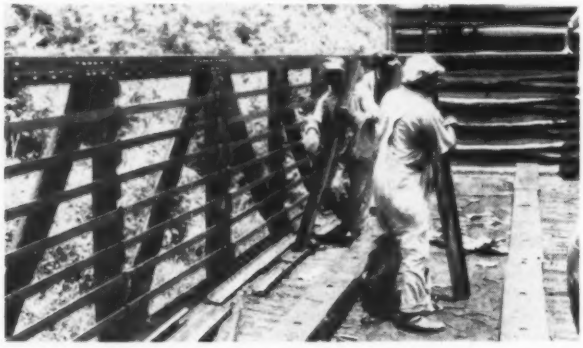
VERTICAL SLATS are pulled out and dropped on the opposite side of the car as local freight containing tie car approaches unloading site.

TIES are counted as they are unloaded for the purpose of placing 25 of them between each pair of stakes previously set on shoulder by foreman.

road's car shops at Centralia, Ill., the car was loaded with ties at the treating plant, with the ties placed transverse to the length of the car, and taken out on the line for unloading. After a few trials it was evident that this design was not satisfactory because, in many instances, the ties were jostled sufficiently in transit to impinge on the slats.

To overcome this difficulty it was decided to revise one side of the car to try out vertical slats. Horizontal steel angles were riveted on the inside to the tops and bottoms of the uprights and slots were cut into them for accommodating six vertical slats between each upright. Holes, into which the pointed end of a tie hook could be inserted, were bored through each end of the vertical slats to assist in their removal.

Horizontal slats didn't work . . .



DEFECT of this arrangement was that pressure of ties against slats made it difficult to remove them.

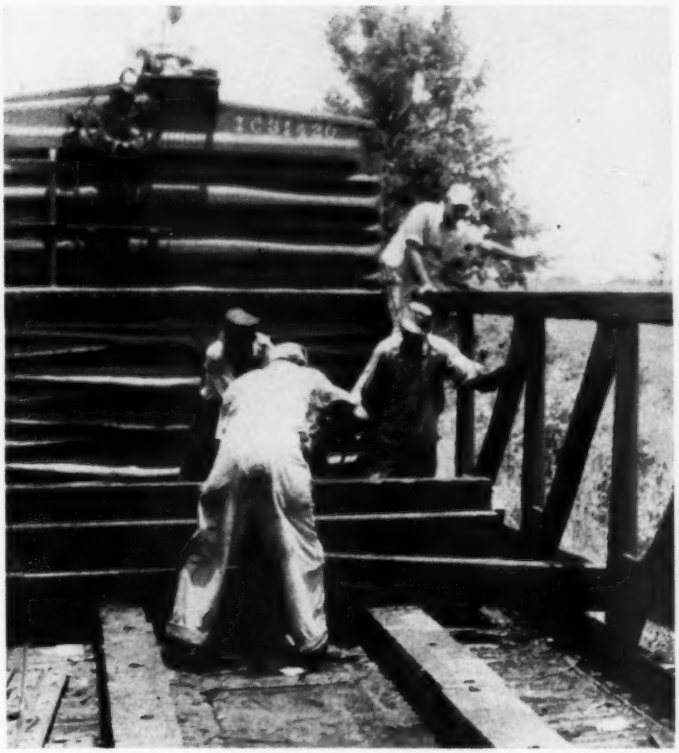
A few trial runs with this design convinced the road of its superior design, but pointed up two weaknesses. The vertical slats were not strong enough to prevent them from bending and allowing ties to work through between the slats to protrude beyond the car side. Also, the bottom angles, extending for the length of the car, made it necessary for the men to raise the ties lying on the floor of the car before they could be ejected. This was corrected by substituting vertical slats of channel steel and by bolting two lines of timbers to the floor of the car for its entire length. The result is the car of present design.

How it is used

The car has been tested repeatedly with its current design and the tests have proved that four laborers can unload a carload of ties in less than half an hour. For controlling the number of ties being unloaded, the section forces plant stakes on the roadbed shoulder for every 25 ties which are to be renewed. The foreman rides the car as the four trackmen unload the ties and he counts the number coming off the car. He is also in position to signal the engineer when to speed up or slow down. Usually, the foreman has another man on the ground who follows behind the train and pulls away those ties which fall too close to the rails.

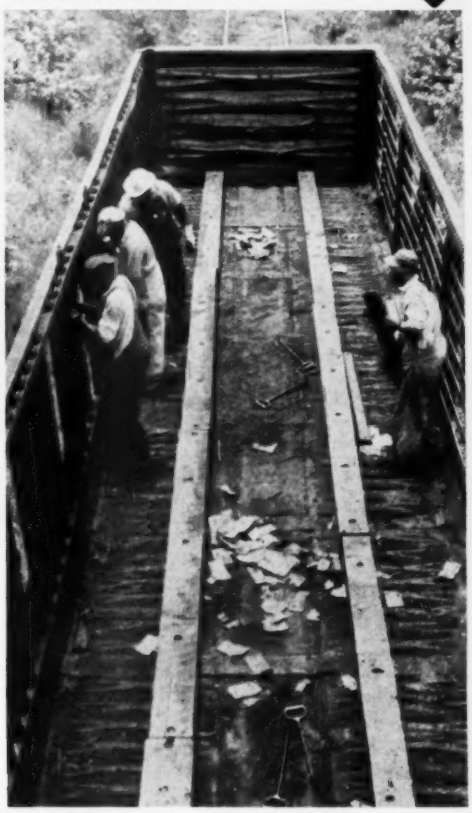
At the start of the unloading work, the four men in the car pull the slats and drop them to the floor of the car on the opposite side. Then, each equipped with a small tie hook, they unload the ties by hooking their ends and sliding them out. Where the car-side uprights or diagonals

hat f borers can empty a full car of ties in less than half an hour



AMPLE SPACE is available between car-side members through which to slide the ties. Note that bottom ties clear side angles.

VERTICAL SLATS are returned to the side of the car after all ties have been unloaded. Car is then ready for another load.



interfere with the end movement, the tie must be pulled to one side before ejection.

Cost studies (including supervision, labor and work-train expense) indicated that conversion of the cars was economically justified. With this fact established the road undertook the conversion of a limited number of cars for tie-distribution purposes. This work includes repairing the running gear, removing the sheets and installing vertical slats on both sides, welding any drop bottoms in the closed positions, installing the two lines of floor timbers, and painting.

Less labor, increased safety

Experience with the special car shows several distinct advantages. There is a marked decrease in the hand labor required. The ties are slid out easily through the sides of the car by one or two men as compared with the three or four men required when lifting the ties over the sides of gondola cars. There is less hazard when the ties do not have to be lifted. No expensive machinery or tools are required nor is any special handling required while loading the ties at the treating plant. The ties generally fall perpendicular to the track and close to where they are to be used. Revenue service is not deprived of any sorely needed cars. And, substantial economies are effected.

The special tie car was developed under the general direction of J. C. Jacobs, engineer maintenance of way, with the cooperation of L. H. Schierbecker, general superintendent of the car department, and H. H. Young, general superintendent of the car shops at Centralia, and R. B. Radkey, engineer ties and treatment.

CHANNEL-TYPE steel was used for the fabrication of the vertical slats to strengthen them against bending.

IMPROVED MODEL of the Mannix sled has hydraulic controls for adjusting the rear scraper blades. The hand pump is mounted on one side and can be easily detached for moving the sled under and from beneath the track.

Does better, faster work with

The Rock Island recently used a Mannix sled for skeletonizing and raising its track near Hope, Minn., where gravel ballast was being replaced with slag. The sled used was an improved model on which the scraper blades are adjusted by hydraulic controls to suit spreading conditions while the equipment is in motion. The railroad found that this and other improvements enable a better job to be done in less time than with earlier models.

● "We have already raised 22 miles of track with this new sled. It does a much better job than the old one we had. We get a smoother roadbed, the ties don't bunch up, and we save a lot of time in adjusting the rear flaps."

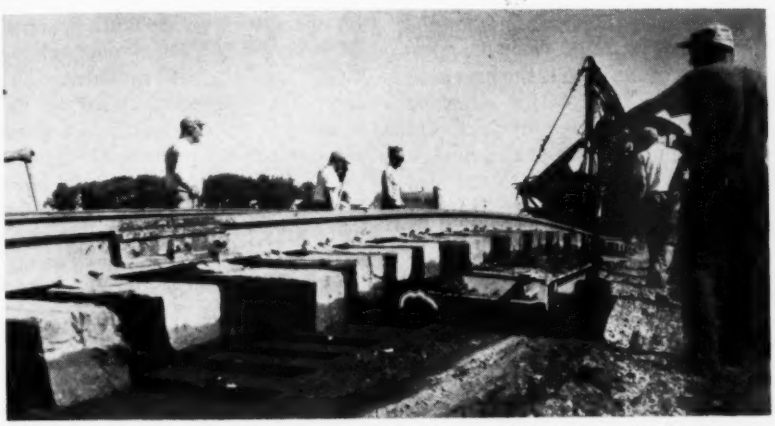
The speaker was T. J. Burian, assistant roadmaster in charge of a Rock Island raising gang working near Hope, Minn. He was discussing an improved sled (see description of improvements in adjoining columns) that the company had rented from Mannix International, Minneapolis, Minn., for skeletonizing and raising the track where the road was changing from gravel to slag ballast.

The sled was being used to break down the gravel-ballast cribs, fill the old tie beds and smooth the roadbed for receiving the slag ballast. Operation of the sled resulted in an initial track raise of about 2½ in, which was followed by a final raise in connection with the surfacing operation.

The improved sled is introduced beneath the track in the conventional manner by jacking up the rail and ties, using a Caterpillar D6 bulldozer to push the sled into position, and removing the jacks to lower the track on the sled. It is then attached by steel cables to a flat car of a work train and pulled along beneath the track. On the Rock Island, this flat car also carries a 10-ft boom and chain hoist mounted on a steel frame, for loading and unloading the sled.

The Rock Island was using the sled with the first of two gangs employed for raising and ballasting

OPERATOR controls the position of the scraper blades while the sled is in motion. Older models required frequent stopping for adjusting the blade position.



SMOOTH SURFACE is obtained uniformly with the improved sled. Extension blades were applied to widen roadbed and reduce windrowing.

wit mproved track sled

work. The first gang, consisting of 40 laborers, did the skeletonizing, initial raising, tie-renewal work, initial track lining, and unloaded the ties and ballast. The second gang, employing 6 machine operators, 1 machine-operator helper and 19 laborers, did the final raising, tamping, lining and dressing.

The sled was being pulled forward at the rate of from 1½ to 2 mph. It was found that a slower speed produced a jerky movement of the sled, resulting in uneven roadbed, while a faster speed did not permit the men in the gang to keep up with the sled.

Changes flap position in motion

The man working the new hydraulic scraper-blade controls walks alongside the sled and actuates the pumps as necessary. Although he frequently observes the roadbed behind the sled to note if windrows are forming on the shoulders, he can tell better whether or not the sled is performing correctly by noting, through the top openings in the sled, the quantity of ballast being carried forward by the scraper blades.

Best when half full

Experience has shown that when these openings are half full with ballast the best results are obtained, so he manipulates the controls to achieve this result.

Mr. Burian stated that the old sled used last year had to be stopped on an average of once every seven minutes to make adjustments to the position of the blades. With the improved sled, no stopping is necessary for making these adjustments. Also the crossties do not bunch up as they did last year.

Spreader used first

Prior to the arrival of this gang, the Rock Island used a Jordan Spreader to cut down the embankment shoulders for providing a place for depositing part of the crib material.

The road also extended the scraper blades of the sled outward one foot on each side for forming a level area for the deposition of the new slag ballast.

On hot days, the road has found that there is a tendency for the skeletonized track to get out of line where the rails are tight. On such occasions Mr. Burian works a Trakliner behind the tie-renewal operation until the tie cribs can be filled with new ballast. A slow order of 10 mph is placed on the open track and 25 mph on filled track.

Sledding is limited by Rocket

At the location where this gang was working, it was necessary for the sled to be removed from the track at 11:00 a.m. to permit the track to be restored to proper line and surface in time for the passage of the Twin Star Rocket. As a result, the work was being progressed at the rate of about 4,000 ft a day. Tie renewals averaged about 200 per mile.

Immediately following the removal of the sled, the work train was used to fill the skeletonized track with ballast and to furnish more ballast ahead of the second gang for raising the track to its final elevation. Slag ballast was unloaded at the rate of approximately 1,500 cu yd per each mile of track.

The surfacing gang is equipped with a Nordberg Power Jack, three Jackson Multiple Tampers, a lining scope and a Nordberg Trakliner. The operators of the three tampers each make two insertions of the tamping blades at each tie. About 5 in of slag ballast was applied under the ties.

For details of sled improvements →

How and why of the sled improvements

The Mannix sled* is a patented device which is inserted beneath the ties and pulled along by a work train for the purpose of raising and skeletonizing the track. It is about 12 ft long, 11 ft wide and 1 ft deep with runners on the top and bottom. Performance of the sled on the Rock Island, as described in the accompanying article, was influenced by several important improvements recently incorporated in it.

Changes to prevent tie bunching—Where the older model had a long tapered center under-runner projecting ahead of the sled proper, this runner on the new model is blunted and begins at the sled. On the other hand, the two top runners for engaging the undersides of the ties, which were formerly blunt at their forward ends, have been extended on the new model and curved downward in a long sweep.

As a result of these changes, bunching of ties during operation of the sled is eliminated. With the older model, the center under-runner raised the ties at their centers but, if the track spikes were not holding firmly, one or the other sides of these ties would drop down to be caught by the blunt top runner and pushed ahead. This tie would push against the following tie and cause a bunching of several ties until matters could be straightened out. With the new model, both top runners engage the ties and lift them on both sides so they slide evenly over the sled.

Hydraulic control of flaps—On the former sled model the two scraper blades, or flaps, mounted on the rear were angled slightly to cause the ballast, while tumbling forward, to work from the center of the track toward each side. However, this angle was not sufficient to prevent an accumulation of ballast at the center of the track. On the new model the angle of the blade mountings was increased to result in a more even spread of the ballast over the roadbed.

Even more important, from the standpoint of improving the performance of the sled, is the provision of hydraulic controls for adjusting the vertical position of the flaps. On both the new and former sled models these flaps are attached to the sled by continuous hinges along their top edges. By varying their vertical position the sled can be made to scrape deeper or shallower.

The ideal position of these blades is when they are digging and spreading without casting windows along the sides of the track. However, since the condition of the ballast varies in workability from one location to another, perhaps only a few rails away, the vertical position of the blades must be altered frequently to produce the desired even spreading.

With the former sled model the position of the blades was changed by stopping the forward movement of the sled, removing a pin from a perforated positioning bar, striking the blade with a maul until it assumed the desired position, and reinserting the pin. After advancing the sled for a short distance and observing its performance, it could be determined if the desired angle had been obtained. More often than not, a further adjustment would be necessary.

With the new model it is not necessary to stop the forward movement of the sled to make these adjustments. Hydraulic rams, one for each blade, are mounted on the rear of the sled and are attached to the lower portion of the blades. Hydraulic hand pumps, mounted side by side on one side of the sled, are actuated as necessary by a trackman walking along the roadbed shoulder. The rams are pumped outward as the blades are made to assume a vertical position. If the blades need flattening, the trackman releases the pressure at the hand pumps by turning wing nuts. Each blade is operated independently of the other for adjusting the blades to ballast and curve conditions.

Location of holes changed—Another change is in the location of the openings provided in the upper surface of the sled for preventing any ballast clinging to the ties from being dropped behind the scraper blades. These openings have been moved more to the mid-length of the sled where any ballast clinging to the cribs can be made to drop to the roadbed well in advance of the scraper blades.

* See August 1955 and October 1956 issues of RT&S.

HYDRAULIC RAMS at the rear center of the sled (foreground) force the blades toward the vertical position. When blades are to be flattened, thumb screws are turned to release pressure.

BALLAST OPENINGS in top of sled are now closer to the rear and permit better observance of ballast accumulation and better distribution of ballast. Improvements were also made in top runners.

How would *you* have done this job?

Assignment:

At this bridge → install girders to widen roadway like this →

There weren't any rules in the book covering this kind of job, and there wasn't any way of making it seem easy. Recognizing these facts Central of Georgia engineers rolled up their sleeves and went to work. By cribbing, jacking and skidding they got two girders under the deck and between the existing columns. With the help of temporary steel bents these girders carried the load while the outside girders were installed.

By G. W. Benson *

Division Engineer, Central of Georgia, Macon, Ga.

Background

● At Childersburg, Ala., the line of the Central of Georgia is carried over the main city street (which is also a county road) on a rigid-frame viaduct of reinforced-concrete construction. The viaduct, which was built in 1926, also extends over the main track and a passing track of the Southern.

The viaduct, except for that part over the Southern's tracks, consisted of a number of three-span sections or units. Each section was supported on four bents each having two concrete piers or columns. The horizontal clearance between bents was 17 ft.

The county road crossed the railroad at an angle of 20 deg 43 min and originally extended beneath the center-span of one of the three-span units.

During World War II the federal government established a major powder manufacturing plant on the Coosa river on the opposite side of the Central of Georgia tracks from the main portion of the city. Following the war the powder plant was leased to a private concern. Because the river offered an adequate supply of water other major industries were attracted to the area, including a large paper mill. As a result highway traffic at this location, light before the war, now amounts to several thousand vehicles daily.

Because the restricted horizontal clearances under the viaduct were a hazard to safety, due partly to the skew, the state of Alabama requested that the intermediate bents be removed to provide a clear horizontal opening of 36 ft with a vertical clearance of 14 ft. The railroad agreed to carry out the necessary design and construction work for the highway department.

Now see how the Central of Georgia solved the problem ▶

* At the time this project was carried out Mr. Benson was superintendent, structures and material, of the C of Ga. He was appointed division engineer on August 1.

Heavy work in close quarters

After considering various ways of getting the wider roadway needed it was decided that the best method was to retain the existing concrete deck and to underpin it with four plate girders supported on new piers built at the existing end bents of the three-span unit. With the girders in place the intermediate bents could be removed.

The big problem was to get the girders into position under the deck and to transfer the load to them without major interruption to railroad traffic and without exceeding the allowable deflection of the concrete spans.

Here are the major steps that were involved in doing the job:

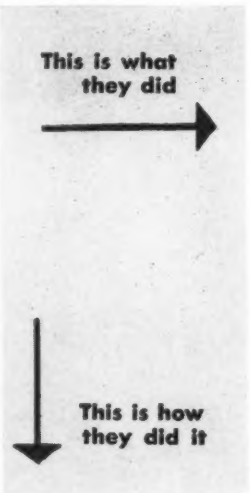
(1) The new piers were constructed (see drawing above) at the location of the end bents, which were completed with the exception of the top 18 in. At the same time footings were constructed between the columns of the two intermediate bents. Temporary steel bents were later erected on these footings.

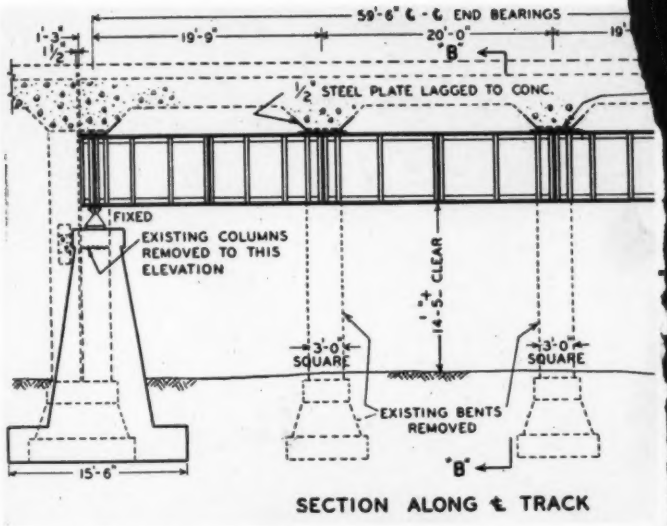
(2) The center girders were erected. Since these had to be placed while the intermediate bents were still in place it was impossible to install them as full-length units. It was therefore decided to install each of these girders in two parts, each about 31 ft long, and to splice them in the field.

The west halves of the girders were erected first. This was done by threading them in between the columns of the bents and jacking them up on cribbing until they cleared the bridge seat. They were then skidded longitudinally to provide space for erection of the east halves in the same manner. After the east halves had been erected and seated on the shoes the west halves were shifted to final position and seated on their shoes. The two parts were then spliced.

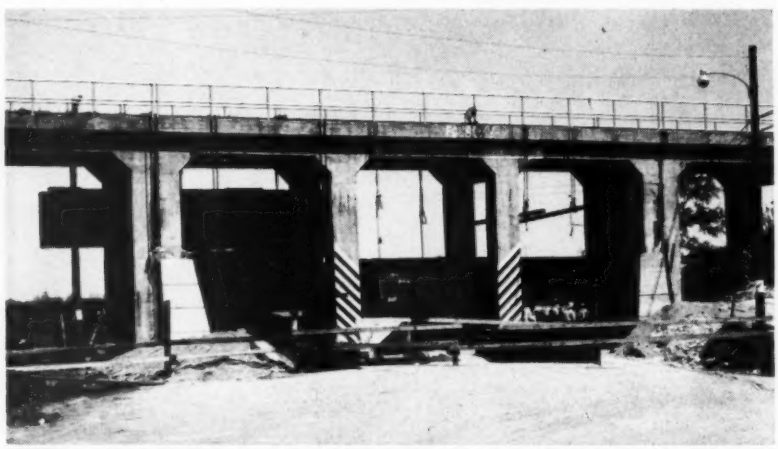
(3) The space (about 3 in) between the old concrete cross-girders and the new girders was filled with grout consisting of Embeco premix and pea gravel. The grout was confined by an assembly of steel grout plates and angles.

(4) The temporary steel bents (see drawing above) were installed between the columns of both intermediate bents. The purpose of these bents was to prevent deflection of the existing deck on removal of the intermediate concrete bents.





TWO INSIDE girders, supported on temporary intermediate bents,



1 WEST HALVES (left) of two inside girders were installed first, then skidded longitudinally so east halves could be installed.

(5) The old bents were removed. The situation when this had been done was that the entire load of the three-span unit was being carried by the two center girders supported on the new end piers and the two temporary steel bents.

(6) The concrete caps for the outside girders were poured on the tops of the new end piers.

(7) The outside girders were erected and the diaphragms and lateral systems placed to connect these members with the inside girders.

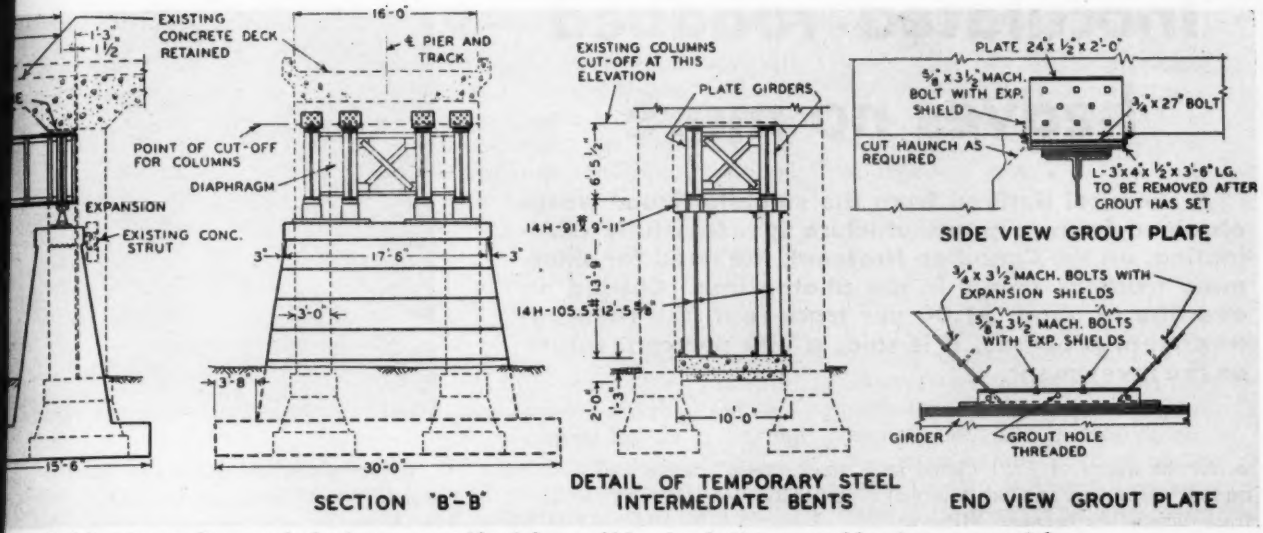
(8) The spaces between the old concrete cross beams and the new outside girders were grouted in the same manner as for the inside girders.

(9) With the load now being carried by the four new girders the temporary bents, along with their footings, were removed.

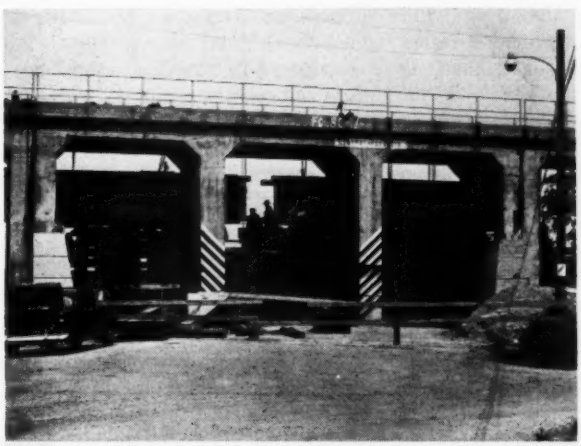
(10) The steel was cleaned, primed and painted.

The project was completed within the time limit established and the estimated cost. All the work was done by company forces except that the steel was fabricated by the American Bridge Division of United States Steel Corporation. Since this was an underpinning job all steel erection was handled by jacking, cribbing and skidding. All field connections were made with high-strength bolts.

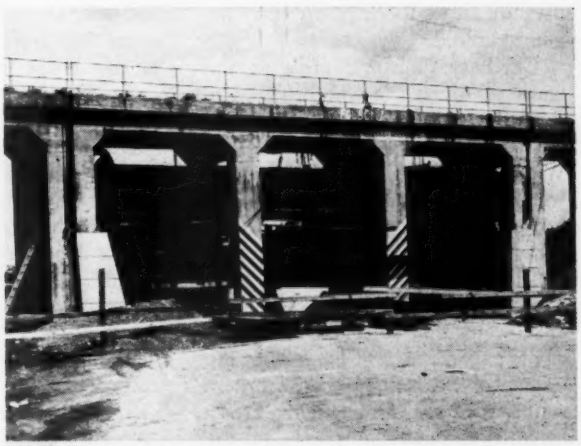
The design work and preparation of detailed plans were done in the office of J. B. McKerley, chief engineer of the C of Ga. Forces of W. E. Chapman, chief engineer, maintenance, performed the work under the author's general supervision.



installed first to permit removal of columns so outside girders could be placed. Note grouted bearings on new girders.



2 EAST HALVES of inside girders have been jacked up on cribbing and seated on shoes at new pier.



3 INSIDE GIRDERS were then joined and spaces between top flanges and cross beams were grouted.

4 TEMPORARY steel bents were placed and old concrete bents removed. Steel bents prevented deflection of deck.

5 OUTSIDE GIRDERS were installed, lateral systems placed, openings grouted and bents removed.

'Inoculated' roadbed heaves no more

A chemical derived from the sulphite liquor waste obtained from pulp manufacture is successfully eliminating, on the Canadian National, the need for shimming track as shown in the photograph. Costing an average of about $1.00 per track-foot, the chemical treatment promises, it is said, a 100 per cent return on the investment.

• As the winter of 1951 closed in on that stretch of Canadian National track which lies between Mileposts 104 and 105 on the Jonquiere subdivision an all-too-familiar story began to unfold.

Capillary moisture, creeping upward through the subsoil, had formed layers of water at and above the frost line beneath the roadbed. With the first "hard" freeze, this water solidified and, as it was transformed into ice, expanded as only water will do. The pressure created by this expansion thrust the now hardened roadbed upward. The more water that collected, the greater the expansion, and the farther the track was heaved up. Slow orders were issued and maintenance crews installed wooden shims between the tie plates and the ties to provide run-offs from the heaved spots. Nature had again performed her annual track "raise" at this and uncounted other locations on the railroad.

Between MP's 104 and 105, some $108 were spent in the winter of 1951-52 for shim materials, while some $96 were expended in labor to install the shims and then, as spring came, to remove them as the track settled to its former level.

During the following four winters, on the other hand, a grand total of only $14.68 was spent for shim materials and a mere $59.88 expended for the necessary labor which, in the interim, had become a progressively higher-priced commodity. What had happened to bring about this considerable reduction in costs—and average annual savings of over $175? Just this: Frost heaving had been cut drastically through injections into the roadbed of a chemical derived from a by-product of sulphite pulp manufacture—called Lignosol.

It was almost six years ago now that Lignosol Chemicals, Ltd., Quebec City, Que., first attempted chemical control of frost heaving in cooperation with the CNR at the location referred to. A 100-ft long section of track where annual heaving had been particularly severe was treated. The heaves promptly disappeared. They have not recurred since, nor has the treatment been repeated. Heartened by this early success, which came upon the heels of years of extensive research and laboratory testing, additional sections of track were treated.

Through 1956, the CNR had applied Lignosol at 34 separate locations, according to the manufacturer. This company estimates that the average annual savings incurred by eliminating the need for shimming is about $740 in materials and $2400 in labor. The cost of the

INJECTION pipe for applying Lignosol to the roadbed is driven to a predetermined depth with a jackhammer.

How Lignosol is applied

The objective of the Lignosol treatment is, in effect, to form a barrier between the ground water and the frost line. The proper depth at which Lignosol should be injected may be estimated from the date at which the heave first appears and will, in most cases, be found to be between 3 and 4 ft below the surface.

The chemical is applied to the roadbed by means of injection pipes driven to the required depth. Lignosol is then pumped into the ground until it breaks through to the surface. The hole for the pipe is usually started with a lining bar. The pipe, 1 5/16 in. in outside diameter, is equipped with a jackhammer bit and a sliding point which prevents it from becoming plugged during driving. After the pipe is driven to the established depth, it is withdrawn 2 or 3 in, opening the sliding point.

Sometimes, it has been found that the soil seems to be completely impermeable and no penetration of the chem-

Scenes like this are disappearing on the Canadian National

Lignosol applied through the winter of 1955-56 was some $3,100 to which is added a labor cost of $2,650. The total cost of applying Lignosol—$5,750—is considered an investment inasmuch as the average savings per year in shimming materials and labor run well over $3,000 for the 34 locations so treated.

All in all, for the 34 locations where Lignosol was applied, an annual return of about 56 per cent on the original investment is being realized. Reports are that no location which has been so treated has required a second application.

What is Lignosol?

Lignosol is a chemical derived from the sulphite liquor waste obtained in the production of pulp for paper manufacture. According to the manufacturer, the product is a dispersant which, combined with subsoil compaction under traffic, effectively reduces the permeability of the subsoil to the extent that frost heaving is virtually eliminated. After innumerable tests in the laboratory and in the field, the manufacturer points out: "It remains to be established conclusively that reduction in permeability is the reason for elimination of frost heaving; for the present, it is the best explanation we have."

Frost heaves, according to Lignosol spokesmen, are not due to the freezing of moisture initially present in the soil, but rather to the freezing of water brought up to the frost line by capillary action. This movement they explain, results in the formation of layers of ice in the soil at the frost line that may attain considerable thickness. The important factors of this process, which are extremely variable, are the distance from the frost line to the groundwater level, the grain size distribution of the soil, and permeability.

In clean gravel or sand, in which there is practically no capillary movement of moisture, the growth of ice layers at the frost line does not occur, say Lignosol technicians. In a clay soil, they add, the capillary movement of moisture is so slow that large ice layers do not form. However, in soils whose grain size is intermediate between that of clean sands and clays, that is, silty sands, and silt soils, maximum growth of ice layers occurs because of the comparatively rapid rate at which capillary moisture can move through such soils.

A dollar a foot

At many locations, it is reported that good results have been obtained with treatments in which the proportion of Lignosol injected into the soil was considerably less than that suggested by the original experimental work. The practical operating treatment was found to be 25 gal of Lignosol B every 6 ft on both sides of the track. This worked out to 5 tons of chemical for each 100 track-feet at a cost of approximately $1.00 per foot.

In the course of the work done on the CNR, it was discovered that the mineralogical classification of the soil did not seem to be a major factor, since sites were chosen without regard to the geology of the terrain. Drainage, says the manufacturer, is of doubtful importance. Successful treatments it is said, have been made in cuts, on level track and in high embankments.

Poor results were obtained where the treatment was made late in the season after the surface of the ground had frozen. However, two of the sites so treated in 1953 began to show improvement two years later.

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ical is obtained. In such cases, it has been found, penetration can be achieved by gently raising the pipe somewhat. Care must be exercised inasmuch as the seal between the pipe and the surrounding ground is easily broken. Resistance to penetration can often be overcome by merely twisting the pipe. High pumping pressures tend to break the earth seal around the pipe, although at greater depths they are often necessary. Once the Lignosol has begun to flow into the ground it has been found that a pressure of 20 psi is normally adequate.

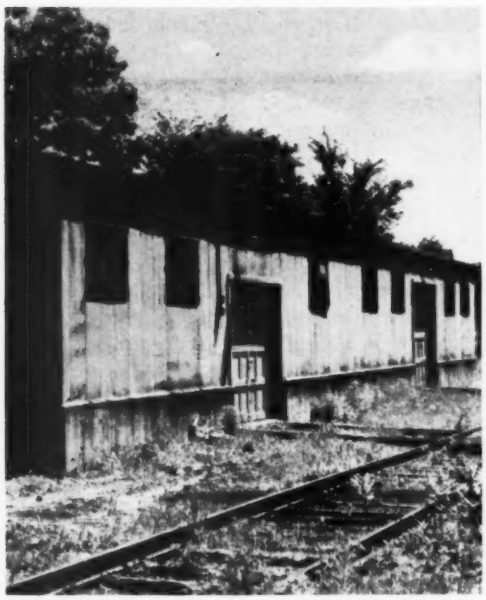
Injections are usually made at 6-ft intervals. With this spacing, 25 gal of Lignosol "B" at 40 per cent strength will provide a concentration of 3 per cent (solids basis) in a layer 1-ft thick, assuming a soil density of 100 lb per cu ft and uniform lateral penetration of the chemical. In practice, however, penetration is usually found to be erratic and Lignosol is pumped until the seal around the pipe is completely destroyed or until it breaks through some crevice to the surface.

PUMPED at a pressure of approximately 20 psi, Lignosol is injected until it breaks through to the surface.

Up again, down again . . .

Getting the most out of prefabu

IN 1949, the Highland camp was dismantled. Today, only slabs, weeds remain.



SIGNALMAN'S headquarters at Holly, Mich., is made of 5¼ hutments shipped from Saginaw last year.

STORAGE building annex (left) at Oak Yard was once a bunkhouse at Atwood Jct. camp.

As the need for labor camps diminished following World War II, the Northern Region of the Chesapeake & Ohio found itself with a surplus of steel, panel-type buildings. With the buildings supplying the versatility, and the road's engineering department the ingenuity, that surplus, too, soon diminished. Today, these buildings, in part, in whole and in combination, the survivors of as many as five reconstructions, are serving faithfully in a wide variety of functions.

• The year: 1948. The location: McDonald, Mich.

Bunk cars for housing trackmen were scarce. Even harder to get were the track materials necessary to build siding trackage to accommodate such cars. To provide housing and related facilities for its forces at McDonald, the Pere Marquette (now part of the Chesapeake & Ohio's Northern Region) erected 12 Armco Steelox buildings—a relatively small part of two large orders placed by the railroad that year with the manufacturer, Armco Drainage & Metal Products, Inc., Middletown, Ohio. Eleven of the buildings were 16 ft by 16 ft and were put to use for housing and other related functions in the newly established labor camp. One building, 16 ft by 108 ft, was used as a combination commissary-mess hall. Let's look at the history of these buildings through the ensuing years:

In July, 1948, five of the smaller buildings and the larger one were dismantled and shipped to West Olive, Mich. Meanwhile, nine additional 16-ft by 16-ft Steelox buildings were delivered new to West Olive. Following standard practice for this type of building, all were constructed on concrete slab foundations which served as floors as well. The buildings that had been brought from McDonald were used to house the foreman, the timekeeper, and the kitchen help, and one was used as a storehouse. Two of the smaller buildings had been joined together to make a single 16-ft by 32-ft toilet and shower house. The remainder of the smaller buildings were all used as bunkhouses.

They're moved again

But this arrangement was not to last long at West Olive. The constantly changing maintenance needs on the district brought about the shipment in April, 1949 of the mess hall building and five of the smaller structures to Highland, Mich. Here, these buildings functioned much as they had before, until January 1951. A camp was then set up at Stark, Mich., incorporating all of the Highland buildings and several others.

fabuildings

UP-TO-DATE maintainer's headquarters at Wixom is a building reconstructed for third time.

PLYMOUTH yard's combination section and signal maintainer's headquarters is composed of four 16-ft square buildings joined together in this, their fifth location.

At about this time the need for labor camps was beginning to diminish. Thereupon, the road's engineering department sent out this word to the division engineers: Look at these buildings before you plan any replacement of existing structures on your division. The buildings at Stark then began to disappear, slowly, a few at a time. Four of the original buildings which had been erected at McDonald five years before and then re-erected successively at West Olive, Highland and Stark, were sent to Plymouth in 1953.

At Plymouth, the four original buildings were joined to provide a single 16-ft by 64-ft headquarters building for section forces and the local signal maintainer. Duo-Therm oil-fired space heaters were installed and water, electricity, and sanitary facilities were put in. Here this building stands today—a far cry from its original status of four separate bunkhouses.

The records in the engineering department at the C&O's Detroit office cite many similar cases. In 1948 alone, some 51 Steelox buildings were purchased for use in labor camps. The total bought for this purpose over a period of years ran well over a hundred. Today these labor camps are no more, but every one of these and other such buildings have been put to use. Originally installed to form labor camps at Atwood Junction, Mich., West Olive, Drew, McDonald, Casnovia, Hartford, Fennville and Baldwin, these buildings are now scattered all over the district. For example, two 16-ft by 16-ft buildings which had first been erected at Atwood Junction, were re-erected at Saginaw, Mich., only to be disassembled and shipped to South Bay City in October 1954. Here, the panels comprising these two buildings were combined with two similar structures—one shipped in from Stark and one brought from McDonald—to provide a single 16-ft by 64-ft structure. This building is serving today as a combination garage (for motor car and truck), tool house, and lunch and locker room for section forces. Utilities and sanitary facilities have been installed.

To show further the versatility which has been obtained by the C&O in these types of buildings, one need only to stop at Holly, just south of Flint, where a Steelox structure is serving to store truck equipment and as an office for the signal maintainer there. Heat, water, electricity and toilet facilities have been installed. Looking at this building, one would hardly guess that this new-looking, 16-ft by 84-ft structure is comprised of five and one-quarter original buildings which were shipped from Saginaw last year, having first served as bunkhouses in the Atwood Junction labor camp.

Today, buildings which served in time of crisis 9 and 10 years ago are serving equally as well in entirely new roles—as communications buildings, garages, tool houses, section houses and storehouses. None the worse for wear after being taken apart and reassembled time after time, it seems likely that these buildings, notwithstanding their modest beginnings, are destined to last for many more years. And, one might well assume that when the C&O discovers a new use for them, they'll be put to it.

Making ties last longer . . .

Coatings—Key to longer tie life?

Much is being said in M/W circles these days about tie coatings. Are they any good? What do they cost? Are they worth it? To get the answers to these and related questions, RT&S surveyed a representative group of railroads. Here's what top M/W men think:

• With the problem of decay pretty well licked by improved methods of wood preservation, plate cutting and checking and splitting are today's prime culprits insofar as tie failures are concerned. It is only natural, therefore, that ways and means should be sought to reduce these actions which so seriously impair the longevity of the average crosstie. Plate cutting, why and how it happens and what is currently being done about it, will be the subject of a forthcoming article in this series on "Making ties last longer." Let us concern ourselves here with checking and splitting.

Why tie coatings?

Authorities on the subject say that most checking and splitting occurs during the seasoning process—before the tie is treated. While considerable attention is being directed at preventing the formation of checks and splits in ties undergoing seasoning, there remains a definite need—at least today—for preventing the growth of checks into splits and splits into gaping fissures in crossties. It is to prevent this growth of fiber separation in the wood that some 40 different tie coating materials have been produced—some commercially, some "home-brewed"—and are now undergoing exhaustive service and accelerated tests in track and laboratory. These commercially produced compounds have been reported in use: Kopper's Tie-Sealing Compound; Daubert Chemical's Protek-Tie and Protek-Coat; Dearborn Chemical's No-Ox-Id; Mortell's Tie Surfacer; Texas Company's Texicote and liquid cements; Witco Chemical's RTC Mastics; Bird & Son's Rubberized Tie Coatings; Zone Company's Libby-Zone Process; Rubber Products' Liquid Rubber Seal; Osmose Osmoplastic; and Acorn Refining Company's Nu-roof Tie Cote.

What does the coating do?

The ideal tie coating, applied to either a new or an old crosstie in track or to bridge ties, serves to prevent the loss of too much moisture from the tie and the entry of too much moisture into the tie, as well. Excessive drying of the wood greatly speeds up the splitting process as the wood fibers become abnormally dry and brittle. Conversely, excessive moisture causes the wood to become spongy, resulting in a loss of strength of the wood fibers. The ideal coating should preserve the proper moisture content within the tie and, by filling whatever checks and splits may already be present, prevent the entry of small pieces of stone, sand and dirt which abrade the wood.

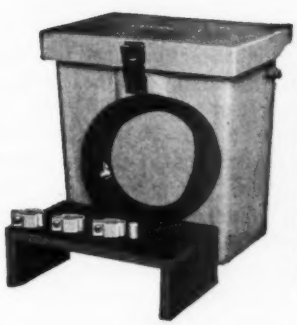
When *RT&S* asked M/W men to relate, in their own words, what they considered to be the advantages of tie coatings, replies such as these were received: "The coatings can inhibit checking . . . and moderate the moisture condition of the tie," (treating plant manager). "We consider the use of a tie coating that will preserve the remaining surface of the tie as a necessity," (engineer of track). "Tie life has definitely been extended," (assistant chief enginner). "Coatings appear effective in sealing top of tie against weather and in reducing checking," (general tie and lumber agent). "Due to filling in checks, they prevent water from getting in and deteriorating the wood and also prevent freezing action." (engineer M/W). "Hold the interior moisture content more constant," (engineer ties and treatment). "Tie coatings are valuable because they tend to keep a more uniform moisture content in the tie. By so doing, they reduce checking and prevent checking below the treatment, which exposes untreated wood to the weather and thus sets up a decay condition," (supervisor, tie bureau). "Will prevent water from getting into cracks," (chief engineer).

L. C. Collister, manager of treating plants, Santa Fe, pointed to two overall advantages for tie coatings: (1) "They will materially reduce the further splitting and checking of ties in track as they tend to equalize the moisture content within the tie. They also tend to fill up the checks that are present thus preventing any water or ballast from accumulating in them and causing further splitting and checking. (2) Coatings will cover up the ragged edges of otherwise good ties and will result in that tie being left in track. The obviously bad ties can still be seen and removed from track."

How are ties coated?

Of the 33 railroads which responded to the *RT&S* survey, the great majority reported that crossties in track were coated only on the top surfaces. Some said they applied the coating material to the ends and portions of the sides. Bridge ties seemed to be getting a more thorough application than crossties. The M/W men questioned were unanimous in asserting that

Railroads are changing from old-fashioned, flickering oil switch lamps to WRRS Electric Switch Lamps. Savings of 50% or more are realized . . . they pay for themselves in two years. Complete package units are available for operation from primary battery or commercial current.



Everlast Battery Boxes, introduced by WRRS during 1956, are being used widely for lighting with air-depolarized batteries. Ruggedly built of glass fiber reinforced plastic, Everlast battery boxes are impervious to chemical attack from ballast, resistant to breakage, and permit adequate ventilation while shedding spray, sleet, snow and rain.

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some mechanical means of application is needed for coating ties. Some use brushes, some paddles, others use spray guns—but, as yet, such work is done mostly by hand. Some of the railroads advised that it is their practice to place a layer of pea gravel atop the coating material to provide additional durability. Others advised against this practice as, they claimed, it breaks up the moisture retention value of the coating.

Typical comments received concerning the application of coatings were: ". . . application should be simplified," (chief engineer). "Asbestos-asphalt coating with pea gravel added will last 5 to 10 years. This can be patched as needed," (assistant chief engineer). "Coated entire tops and 2 in down on ends," (engineer of track). ". . . . Cost of coating, with present methods of application, is too great . . ."(chief lumber inspector). "Sprayed top and approximately 1½ in down on sides and ends," (chief engineer-maintenance). "By hand application to upper surface only," (chief engineer). "Sprayed on and further spread with brushes," (supervisor, tie bureau). "Coating was applied with roof coating brush with emphasis on filling cracks and covering surface of tie," (superintendent). "Zone material applied with Patton Spray Car is now used as standard on bridges," (engineer M/W).

What does it cost?

Labor costs per tie, as reported to *RT&S*, run from 6 cents to 70 cents for application of material to the tops of ties only. Material costs range from 8 cents per tie to 52 cents. Said one M/W man: "The cost of applying coatings is delaying their use. As soon as an automatic machine is developed to apply the coatings satisfactorily and a good economical coating developed that can be purchased, say, in tank-car lots, coating will no doubt receive a great deal more interest, especially if wear beneath plates is further reduced by large plates, tie pads, or other means." Reflecting the general opinion that cost of application is too high, one bridge engineer replied: "The materials look good; we just can't justify the cost of application."

They generally agree on these points:

(1) Tie coatings are definitely effective in preventing the growth of checks and splits and therefore in prolonging the life of the tie.

(2) Economically, the use of tie coatings at the present time is entirely dependent upon conditions. On bridge ties, the practice can definitely be justified. Insofar as track ties are concerned, the development of a mechanized means of application to reduce the present high labor costs incident to tie coating will make the practice unquestionably economical.

(3) The development of tie coatings having longer service-life characteristics will lead to the eventual standardization of the practice on many railroads.

The AAR, in cooperation with the National Lumber Manufacturers' Association, is conducting extensive weathering tests of some 40 different tie-coating materials. Many railroads are carrying out their own service tests — in track and on bridges. Failures of tie-coating materials, to date, have been found to be due to "weathering off" and losses in plasticity and subsequent cracking and rupture of the moisture seal. The better coatings under test appear, from all accounts, to have a *maximum effective service life of from 5 to 6 years.*

Here are typical comments received from railroads: ". . . After 6 years, still adhering good. Has reduced checking—still tacky under a light crust," (supervisor, tie bureau). "The coatings that we have installed that have reached five years' servive life have lost their life. They are dry and do not have any of the resilience or tackiness that were present when the coatings were first applied. We have increased our retention (in treatment) to 12 lb per cu ft of 30/70 creosote-petroleum mixture, knowing that the exudation from this heavy treatment will give us the best coating at the cheapest cost for all of our new ties," (L. C. Collister, Santa Fe). "Condition good after 5 years—some exposed spots where coating has peeled off," (bridge engineer). "After 5 years all tests were badly weathered," (manager, treating plants). "Some slight cracking but generally much better than uncoated ties," (chief engineer). "After 6 years—condition good," (engineer M/W). "After 10 years, coating should be replaced. Tie life was definitely extended," (assistant to chief engineer). "Some tendency to blister and peel after 5 years. This is usually minor and is corrected by second coat when at all possible," (chief engineer). "Coating worn off after 7 years of service," (engineer timber preservation).

Are they worth it?

The big question in the minds of M/W men is whether the expense of coating ties in open track is justified in view of the fact that present coatings are reported to last only 5 to 6 years. While some say yes and others say no, the majority claim the economy of tie coating at the present time is entirely dependent upon conditions. On bridge ties, which represent a greater investment than track ties, they point out that coatings are definitely justified. This, they stress, is especially true in the case of coatings which provide fire protection as well as retardation of checking and splitting. As far as the coating of crossties in open, ballasted track is concerned, it seems that the economic "break-even" point will be reached and surpassed on many railroads as either or both of the following conditions are fulfilled: (1) Longer-lasting coatings, and; (2) mechanized application.

With regard to the former, several top M/W men and leading suppliers predict that, within a few short years, tie coatings will be available that will effectively resist weathering for at least 10 to 15 years without reapplication. And there seems to be no doubt in anyone's mind that the M/W equipment manufacturers won't be long in coming up with a mechanized applicator.

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Guided by a sincere desire to meet and anticipate the ever-changing demands of progress, CF&I has, through the years, closely cooperated with the western railroads in the development of new and improved rails and track accessories.

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track betterment... safety... economy.

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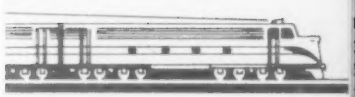

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PROPERTIES OF SECTIONS

ITEM	SECTIONS		COMPARISON OF 100 RE TO CF&I 1060	
	100 RE	CF&I 1060		
AREA: HEAD	3.80 Sq. In.	4.00 Sq. In.	+ 5.3%	
WEB	2.25 Sq. In.	2.50 Sq. In.	+ 11.1%	
BASE	3.90 Sq. In.	3.95 Sq. In.	+ 1.3%	
TOTAL	9.95 Sq. In.	10.45 Sq. In.	+ 5.0%	
Weight per yard	101.5 lbs.	106.6 lbs.	+ 5.0%	
G.T./mile — single track	159.50	167.5	+ 5.0%	
N.T./mile — single track	178.64	187.6	+ 5.0%	
Moment of Inertia (I)	49.00	53.6	+ 4.6 in^4	+ 9.4%
Section Modulus, Head	15.1	16.1	+ 1.0 in^3	+ 6.6%
Section Modulus, Base	17.8	18.8	+ 1.0 in^3	+ 5.6%
Ratio, "I" to Area	4.9	5.1	+ 0.2	+ 4.1%
Ratio, Section Modulus to Head Area	1.5	1.5	SAME	
Distance, Base to N.A.	2.75"	2.85"	+ 0.10"	

Comparative maximum web stresses in the CF&I and A.R.E.A. rail sections, calculated in accordance with the method recounted in the A.R.E.A. Proceedings, Vol. 48, pages 987-991.

	psi	
106 CF&I	18,700	
100 RE	27,300	46%

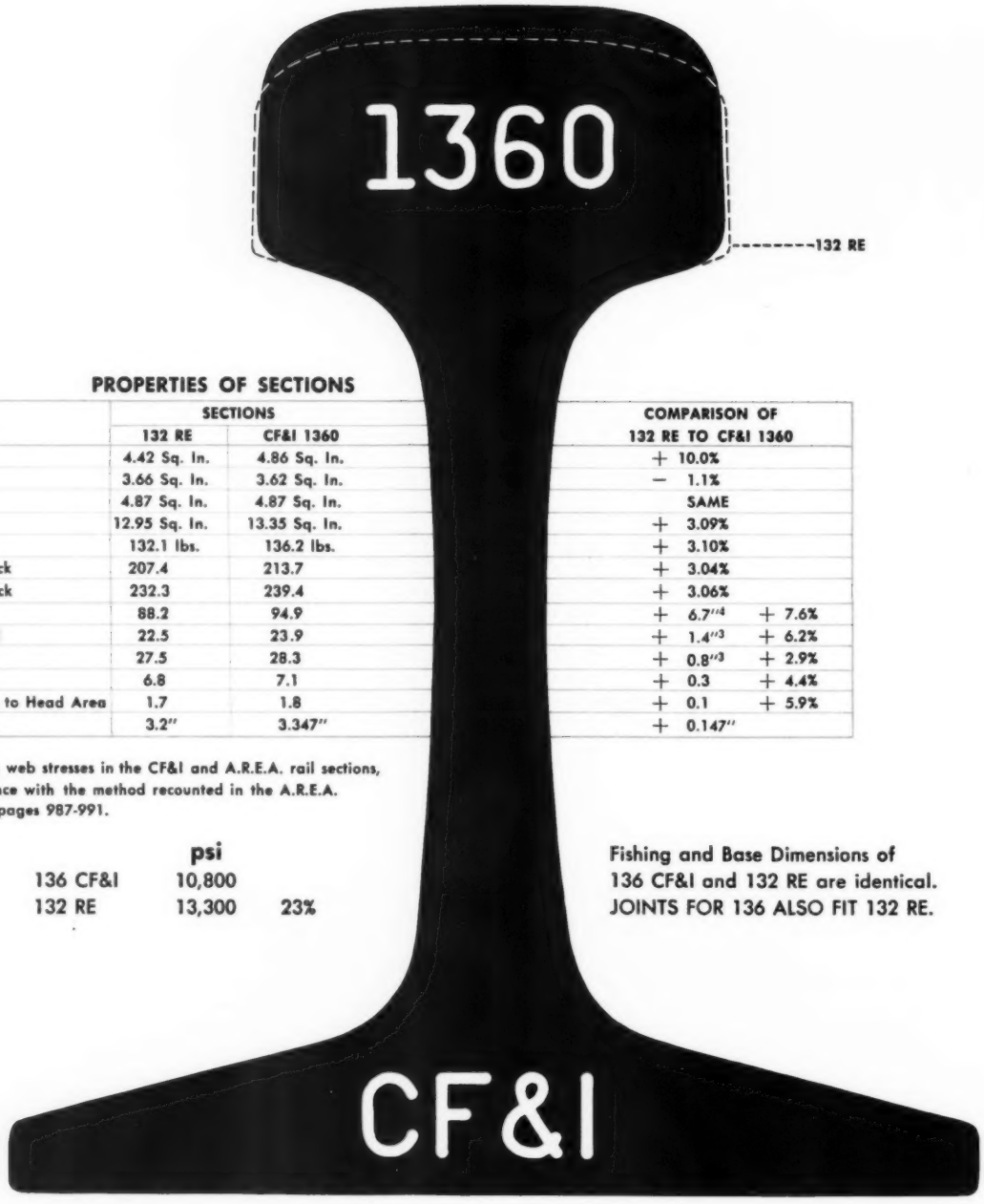
Fishing and Base Dimensions of
119 CF&I and 115 RE are identical.
JOINTS FOR 119 ALSO FIT 115 RE.

PROPERTIES OF SECTIONS

ITEM	SECTIONS 115 RE	SECTIONS CF&I 1190	COMPARISON OF 115 RE TO CF&I 1190	
AREA: HEAD	3.91 Sq. In.	4.32 Sq. In.	+ 10.5%	
WEB	3.05 Sq. In.	3.04 Sq. In.	− 0.3%	
BASE	4.29 Sq. In.	4.29 Sq. In.	SAME	
TOTAL	11.25 Sq. In.	11.65 Sq. In.	+ 3.6%	
Weight per yard	114.7 lbs.	118.8 lbs.	+ 3.6%	
G.T./mile — single track	180.7	187.0	+ 3.5%	
N.T./mile — single track	202.4	209.4	+ 3.5%	
Moment of Inertia (I)	65.6	71.4	+ 5.8 in^4	+ 8.8%
Section Modulus, Head	18.0	19.4	+ 1.4 in^3	+ 7.8%
Section Modulus, Base	22.0	22.9	+ 0.9 in^3	+ 4.1%
Ratio, "I" to Area	5.83	6.13	+ 0.3	+ 5.1%
Ratio, Section Modulus to Head Area	1.6	1.7	+ 0.1	+ 6.3%
Distance, Base to N.A.	2.98"	3.124"	+ 0.144"	

Comparative maximum web stresses in the CF&I and A.R.E.A. rail sections, calculated in accordance with the method recounted in the A.R.E.A. Proceedings, Vol. 48, pages 987-991.

	psi	
119 CF&I	13,400	
115 RE	15,200	13%



PROPERTIES OF SECTIONS

ITEM	SECTIONS 132 RE	SECTIONS CF&I 1360	COMPARISON OF 132 RE TO CF&I 1360	
AREA: HEAD	4.42 Sq. In.	4.86 Sq. In.	+ 10.0%	
WEB	3.66 Sq. In.	3.62 Sq. In.	− 1.1%	
BASE	4.87 Sq. In.	4.87 Sq. In.	SAME	
TOTAL	12.95 Sq. In.	13.35 Sq. In.	+ 3.09%	
Weight per yard	132.1 lbs.	136.2 lbs.	+ 3.10%	
G.T./mile — single track	207.4	213.7	+ 3.04%	
N.T./mile — single track	232.3	239.4	+ 3.06%	
Moment of Inertia (I)	88.2	94.9	+ 6.7″⁴	+ 7.6%
Section Modulus, Head	22.5	23.9	+ 1.4″³	+ 6.2%
Section Modulus, Base	27.5	28.3	+ 0.8″³	+ 2.9%
Ratio, "I" to Area	6.8	7.1	+ 0.3	+ 4.4%
Ratio, Section Modulus to Head Area	1.7	1.8	+ 0.1	+ 5.9%
Distance, Base to N.A.	3.2″	3.347″	+ 0.147″	

Comparative maximum web stresses in the CF&I and A.R.E.A. rail sections, calculated in accordance with the method recounted in the A.R.E.A. Proceedings, Vol. 48, pages 987-991.

	psi	
136 CF&I	10,800	
132 RE	13,300	23%

Fishing and Base Dimensions of 136 CF&I and 132 RE are identical. JOINTS FOR 136 ALSO FIT 132 RE.

COMPARISON OF THREE CF&I SECTIONS RELATIVE TO A. R. E. A. SECTIONS BASED ON ACTUAL SIZE.

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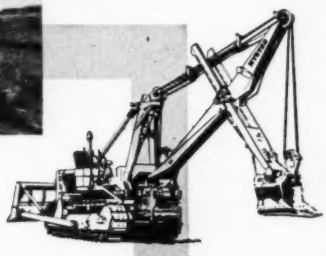
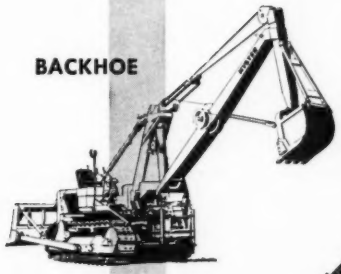
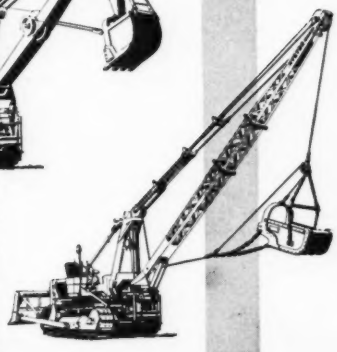


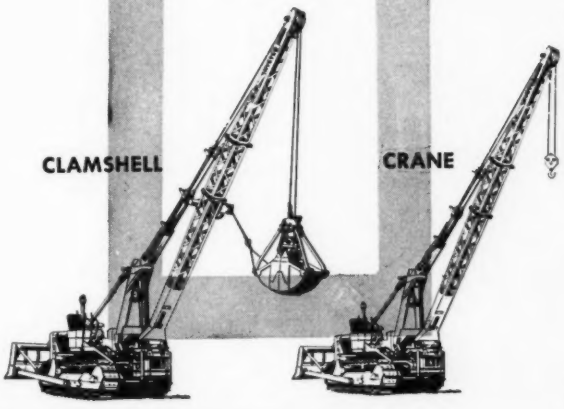
SHOVEL

BACKHOE





DRAGLINE



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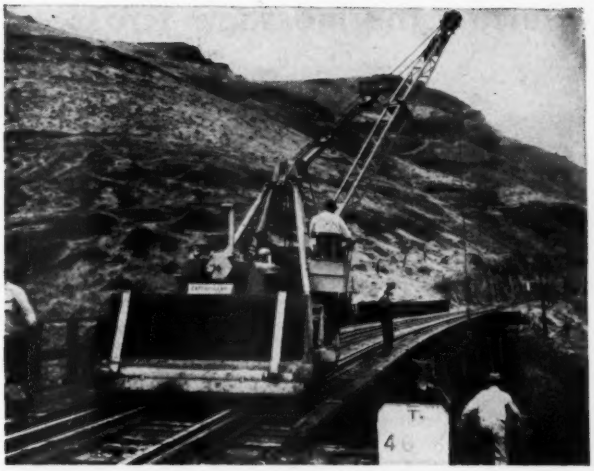

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Gives you full-production —Shovel, Backhoe, Dragline, Clamshell or Crane.

Bulldozer
Ready at all times for light dozing. With the boom removed, it's ready for high production and heavy dozing jobs.

Ask your Caterpillar-Hyster Dealer for further details.

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FACTORIES: Portland, Ore.; Danville, Ill.; Peoria, Ill.; Nijmegen, The Netherlands.

4049

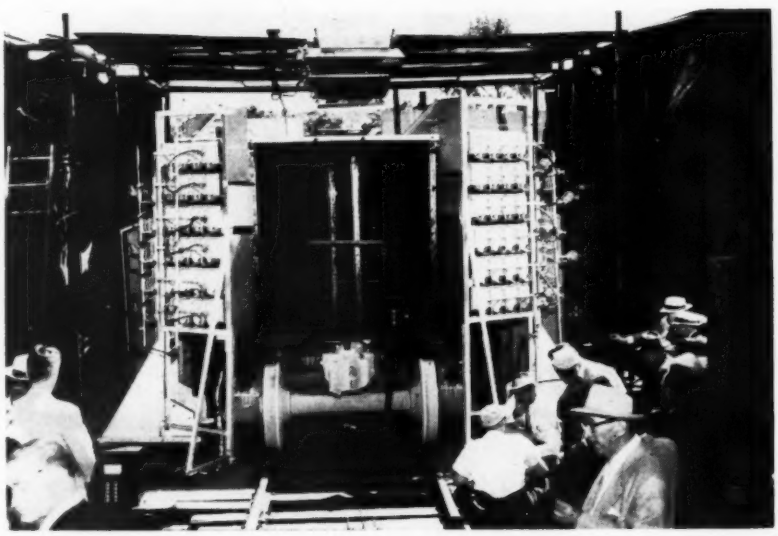
Getting the message across . . .

PROMOTIONAL slogan, "Route freight up here. Keep highways clear," was incorporated along with new paint job on the EJ&E's Sheridan Road overpass in North Chicago by the road's engineering department. Idea of promotional displays such as this on engineering facilities is becoming more widespread.

M/W TRUCKS and other such vehicles on the Delaware & Hudson are now adorned with full color signs which advertise the road's freight service. The trucks, which travel extensively over the highways in the area served by the road, serve literally as roving billboards."

News briefs in pictures . . .

NEW VERTICAL-LIFT bridge over the Cuyahoga river at Cleveland has replaced the Nickel Plate's rolling-lift span which had been built in 1907. The new 267-ft bridge, built jointly by the railroad and the U. S. Corps of Engineers at a cost of about $5 million, was installed to permit lake vessels of more than 600-ft length to reach the steel mills up the river. The new span provides a navigable channel of 200 ft between bulkheads, as contrasted with the 120-ft opening of the old bridge. Erected above the old structure, the new bridge could not be lowered until the old span had been removed.



NEW HEATING method for thawing frozen ore cars was demonstrated recently at Cleveland by Perfection Industries, Division of Hupp Corp. The new method utilizes infra-red rays produced by a gas infra-red generator. In the demonstration, an ore car was filled to its 80-ton capacity and frozen to a depth of from 6 to 8 in on all sides, top and bottom. A bank of the German-developed heating units, known as the Perfection Schwank Gas Infra-Red Generators, thawed the car so that it could be dumped in a matter of minutes. An operating temperature of 1650 deg F is achieved in the generator by burning gas on the surface of a patented ceramic mat. The gas is converted into infra-red energy wave-lengths readily absorbed by most materials. Demonstration was carried out with the cooperation of the Duluth, Missabe & Iron Range.

Safe!

You are safe all around in using the Improved Fair—

1st — It's easy to install

2nd — It's strong and dependable

3rd — It's effective and assures dependable service for many years.

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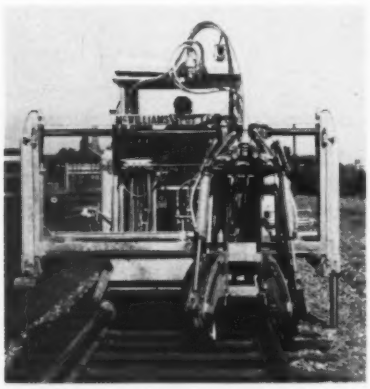
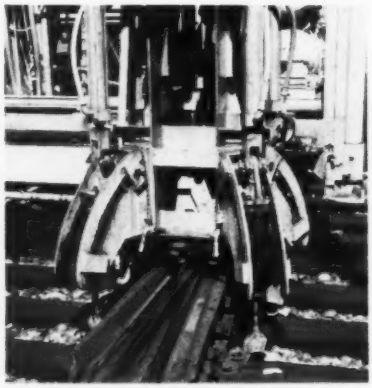
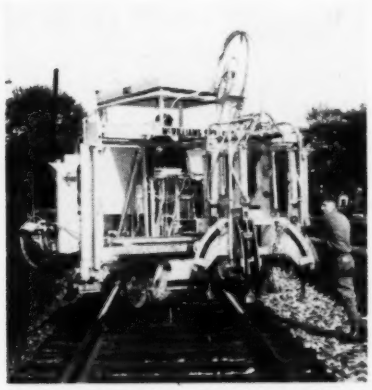


McWilliams spot tamper showing tamping head in inboard tamping position.



Closeup of tamping head showing operation around frog.



Spot tamper being turned on hydraulic spud for reversal of direction or setoff.

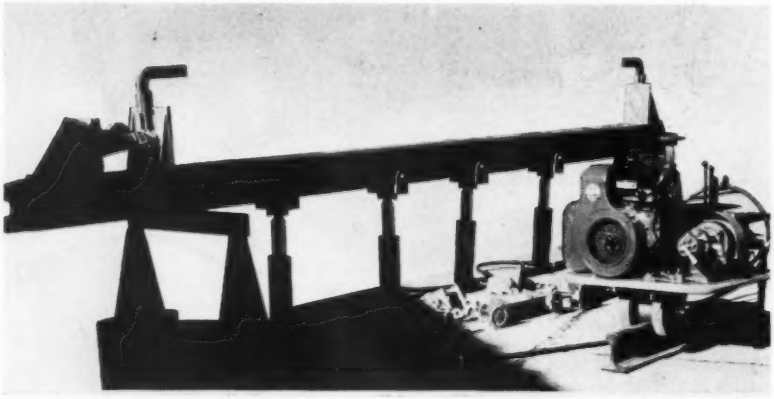
Self-contained jacks on . . .

New spot tamper

DESIGNED to provide big-tamper compaction quality, a new spot tamper has been developed for smoothing, spot surfacing, and yard and terminal maintenance. It is also designed for general tamping on railroads where trackage does not warrant the production-type tamper. The new machine clamps itself to the rails and raises the track to the designed height by using one of two self-contained hydraulic jacks. Four air-operated guns of special design are used for tamping in two positions at each rail. The tamping cycle for both ends of a tie is about 35 sec.

The manufacturer claims that the McWilliams spot tamper provides solid tamping of the same uniform pattern as the larger McWilliams tamper. Each of the four tamping guns provides the same down pressure per tool as is available with the larger tamper.

Since the tampers are located ahead of the wheels, the machine will, it is claimed, tamp off jacks with no settlement when jacks are removed. The spot tamper has been designed as a utility machine inasmuch as spiking and bolt-tightening attachments can be added. In operation the machine performs as follows: (1) Machine is spotted with rail clamps under base of rail; (2) either or both lifting cylinders lower into the ballast until the track is raised to the desired height; (3) tamping pad is lowered hydraulically and tamping is done in eight positions; and, (4) If tamping both ends of the ties is desired, the guns are moved horizontally to the other rail where eight more positions are tamped. The machine is also equipped with a hydraulic spud which can be lowered to raise the machine from the rails, allowing it to be turned by one man. *Railway Maintenance Corporation, Dept. RTS, Box 1888, Pittsburgh, Pa.*



Cap renewal aided by . . .

New bridge tools

A NEWLY developed group of bridge tools is now available for assisting in trestle cap renewals. The group includes a hydraulic power unit, a jack beam for open-deck trestles and one for ballast decks, a set of four hydraulic cylinders with supports, a bridge scaffold, hydraulic bolt puller, and a hydraulic bolt cutter.

The power unit has a wheelbarrow type of mounting and consists of an aircooled engine, hydraulic pump, filters, reservoir, valve assembly, and two hose lines.

Jack beams are H-sections and have hangers for attaching to the trestle deck. The 22-ton capacity cylinders have heads with double rollers that permit them to move along the lower flanges of the jack beam until positioned next to a pile. The cylinder supports are clamped to the piles.

The bridge scaffolds are of welded steel construction and hang from the deck by chains. They are used on each side of the bent to aid in positioning the jacks and supports.

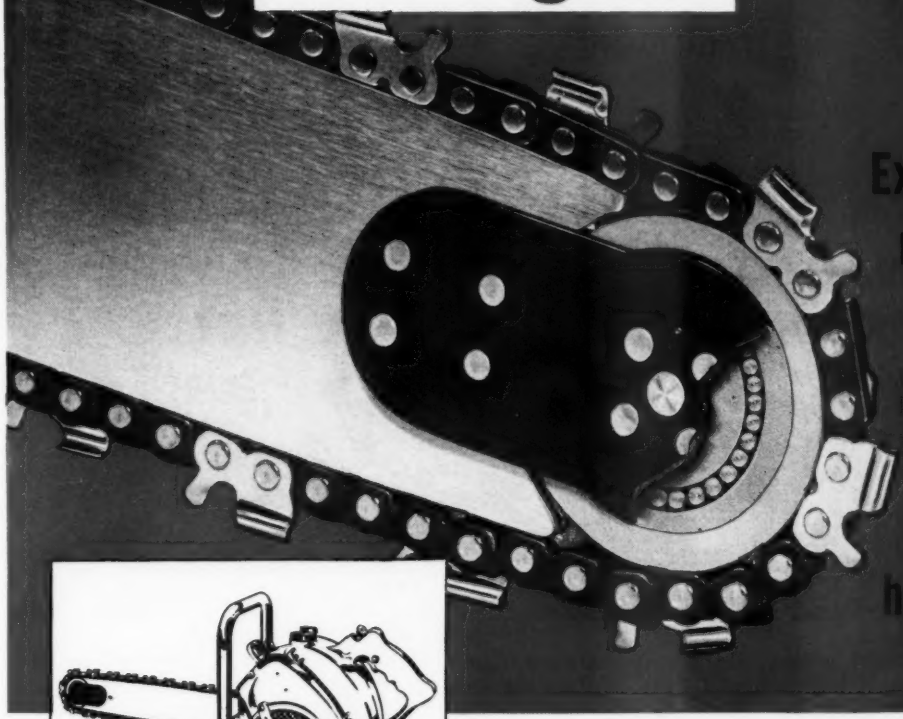
Drift bolts can be removed by the hydraulic puller which has a 24-in stroke. The hydraulic bolt cutter is made to cut ¾-in bolts. Both of these units include a control valve.

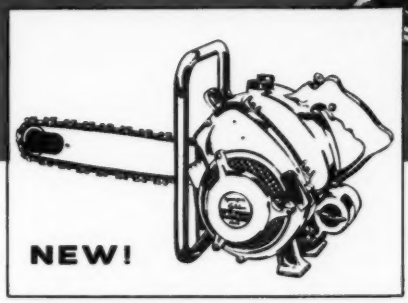
In use, the jack beam is hung from the deck next to the cap. The cylinders are located next to the piles, and the supports clamped in place on the piles. Hydraulic power from the unit extends the cylinders and raises the deck. Drift bolts that are accessible are removed by the bolt puller. The remaining bolts are cut by the power cutter. The cap can be pried down (or up) to get at the other end of the bolts. Bracing is unfastened prior to jacking. The old cap is then removed, a new one installed, the deck is lowered, and bracing and drifting is the final step. *Fairmont Railway Motors, Inc., Dept. RTS, Fairmont, Minn.*

(*More on page* 70)

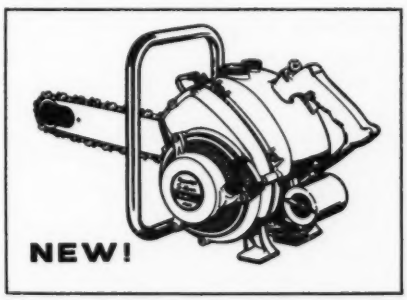
now, in chain saws, too,

if it's Remington, it's right!





Golden "Logmaster". 5 hp. class, 1 cylinder, air-cooled, 2 cycle. Bar sizes 18", 24", 30". 27 lbs. As low as $285.00* complete.



Silver "Logmaster". 3 hp. class, 1 cylinder, air-cooled, 2 cycle. Bar sizes 18", 24", 30". 26 lbs. As low as $229.00* complete.

**Prices and specifications subject to change without notice.*

More work in less time with less wear!

The greatest chain saw development in years! That's what timbermen call the revolutionary new Roller-Bearing Nose on Remington chain saws by Mall.

The nose actually revolves on precision-ground high-grade steel roller bearings (shown above in cutaway picture). And by reducing friction between bar and chain, the Roller-Bearing Nose increases chain speed up to three times, boosting actual cutting horsepower up to 20 per cent! Because of the faster chain speed, you can fell, buck and limb more timber in less time than ever before. And the reduced wear on chain and bar increases the life of both, an important money-saving factor!

The spectacular Roller-Bearing Nose is another power-boosting exclusive on the Remington line of Mall chain saws. No other make has it!

For a free copy of our new, fully-illustrated 24-page catalog showing the complete Remington line of Mall chain saws, just fill out the convenient coupon.

Fast, efficient chain saw service is available at a network of service stations. Write for our Chain Saw Service Directory or see your retailer.

REMINGTON—*manufacturer of sporting firearms and ammunition—famous for quality for 141 years.*

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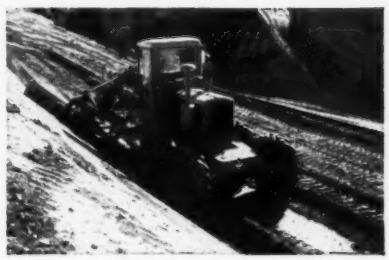
FOR RIGHT-OF-WAY MAINTENANCE

HUBER-WARCO 5D-190 MOTOR GRADER
HELPS KEEP TRAFFIC RUNNING ON TIME



Among modern railroad systems, the use of rubber-mounted equipment for track and right-of-way maintenance is rapidly replacing track-mounted equipment. There is no longer a need to hold up trains or lose important work-crew man hours, while this equipment is moved to a sometimes distant siding.

The Huber-Warco 5D-190 motor grader fits right into this new approach to modern railroading. One man and one grader can perform a variety of jobs without tying up mainline traffic. With plenty of power (195 h.p.) and weight (31,450 lbs.), blended perfectly together for top efficiency, it is possible to move more material with fewer passes.

An Allison torque converter protects the unit from shock loads while a full power-shift transmission—WITHOUT CLUTCH— permits quick shifts under full load, without interrupting the power flow from the engine to the load. A tail shaft governor automatically adjusts engine RPM to meet any load condition, at any speed set by the operator.

Exclusive with Huber-Warco motor graders is the completely hydraulic cab-controlled blade movement which permits the blade to be moved from 90° on one side to 90° on the other without leaving the cab. There are no manual adjustments.

A power sliding moldboard is standard equipment on the 5D-190—there's no deviation from the line of travel. Other important features include: full 360° blade rotation without removing scarifier teeth; four wheel brakes are standard; high front and rear axle clearance; wheels and tires are interchangeable; and all controls are within easy reach of the operator.

Other Huber-Warco torque converter grader models include the 6-D and 7-D series. Models with standard transmission include the 4D-75, 4D-85, and 4D-115. For a demonstration—see your nearest Huber-Warco distributor.

For a demonstration — see your nearest Huber-Warco distributor

HUBER W WARCO

HUBER-WARCO COMPANY

MARION, OHIO, U. S. A.

Road Machinery

CABLE ADDRESS: HUBARCO

ROAD ROLLERS • MOTOR GRADERS • MAINTAINERS • GRINDERS

ORTON

the most *POWERFUL*
name in CRANES...
and *PILE DRIVERS*

An ORTON Pile Driver *built to specifi cation* hoists, rotates, travels and oper ates the pile-driver leads, powered by GM diesel engine with fluid torque con verter. Self propelled at 24 mph o level track. Easily negotiates 5% grade pulls 10 loaded cars weighing 70 tons o level—or 1 such car on 4% grade. Hy draulic pumps and auger attachments Ask for catalog No. 90.

All ORTON cranes operate on STRAIGHT DIESEL POWER. This enables ORTON to give a 10-year guarantee on travel gears without limitation due to accident, derailment, misuse or other cause. Idles at 600 rpm instead of 1800; reduces engine wear immensely; reduces fuel consumption to about ¾ of diesel electric operation. No danger of setting fire to combustible material on road beds. Moisture—even flood waters, won't immobilize an ORTON straight diesel machine.

ORTON CRANE & SHOVEL CO., 608 S. Dearborn St., Chicago 5, Ill.

An ORTON *Combination* PILE DR VER, 160-ton DIESEL WRECKE and BRIDGE DERRICK *built to spe fication*. Pendent pile driver leads p mit batter in both directions. Can equipped for use with air or diesel-op ated hammer. Above: in use as a p driver; large photo at left: same machi as a wrecker. Ask for catalog No. 89.

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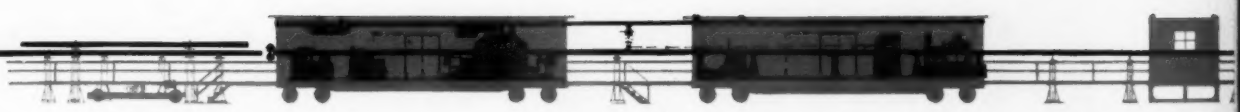
thorowel
rail

MATISA

EQUIPMENT CORPORATIO

1020 Washington Avenue • Chicago Heights, Illin

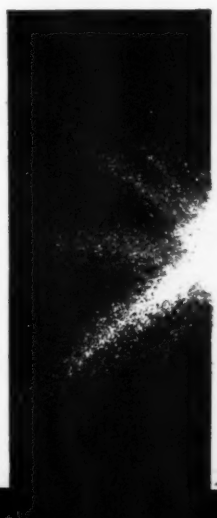


Proved* and improved
Matisa Flash thoroweld experience
and equipment is available to
give you safe welded rail, now

the quality of the weld is MATISA'S first consideration

Imperfect welds mean broken rails. A Matisa thoroweld starts right—with a burn-off of rail impurities . . uniform heating over the entire surfaces of both joining faces . . . a 50-ton impact blow completes a forging-quality union of rail to rail. All operations are automatically precision-timed while rails are rigidly clamped in alignment—your assurance of weld after weld of the same high quality.

**Pioneered by the Santa Fe . . . and the Great Northern railroads. Send for brochure showing the complete thoroweld process.*



matisa production line efficiency

Matisa production is planned production. The entire process has been broken into job elements; a planned work station for each. Each job element is mechanized and geared to maximum weld production and the most effective use of today's expensive manpower.

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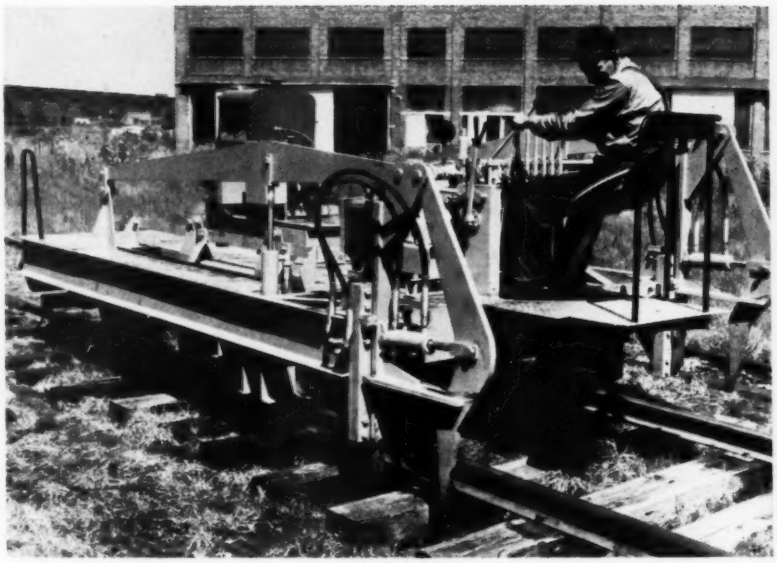


ABOVE—Tongs in position over a tie. LEFT—With tongs gripping the tie it can be spaced or nipped for spiking.

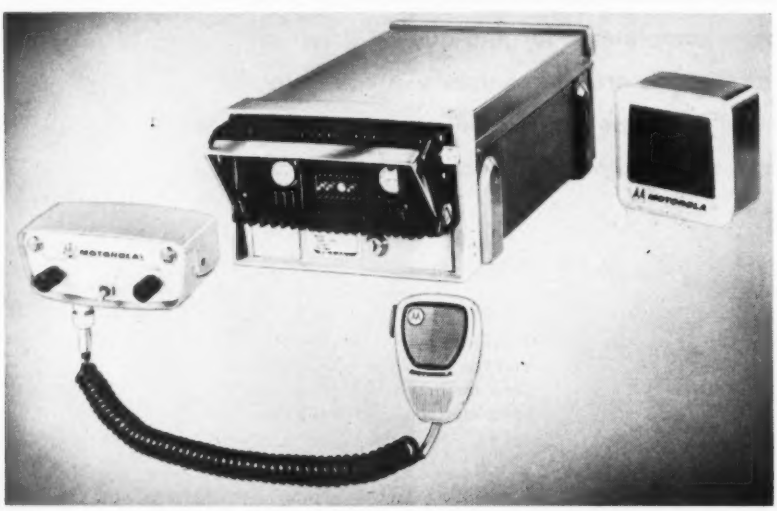
Hydraulically operated . . .

Tie-spacing machine

THE Pullman-Standard Tie Spacer, recently introduced, is a self-powered machine that is said to be capable of handling any tie-spacing and straightening program. This hydraulically operated machine is designed to space and straighten new and old ties during heavy tie-renewal operations, to provide for out-of-face spacing where the number of ties per rail is changed and to straighten and space ties ahead of the tamping operation. It may also be used to nip and hold ties for spiking.

This is a track-mounted, self-propelled machine, powered by a four-cylinder Wisconsin engine. The two tie grippers or tongs are mounted at one end of the machine outside the track rails. By means of hydraulic controls in the hands of the operator, who rides on the machine between the tongs, they can be manipulated as necessary to grasp a tie for straightening, nipping or spacing it. To shift a tie longitudinally with the track two magnetic brakes underneath the machine are applied to the rails after which the entire machine is moved the required distance by a hydraulic ram. The latitude of movement is 20 in.

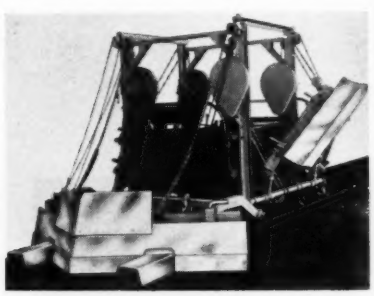
It is said that the tie spacer, requiring but one man to operate, can perform the work of a six-man tie-spacing crew in only a fraction of the time. *Track Equipment Department, Pullman-Standard Car Manufacturing Company, Dept. RTS, 1414 Field Street, Hammond, Ind.*



Temperature protection for . . .

Transistorized radio

HEAT SINKS have been incorporated in the manufacturer's new line of mobile two-way radio units with fully transitorized power supplies. The black-finned radiators conduct heat away from the heat-sensitive germanium power transistors, and permit them to operate with an adequate factor of safety at extremely high ambient temperatures while carrying heavy current loads. The manufacturer claims that extraordinary life and exceptional reliability can be expected from the units even when they are in the trunk of a black car parked in the middle of the desert at high noon in August. The new units are designed to operate from 12-volt batteries having their negative terminals grounded. An important feature of the new units is the fact that both receiver and 25-watt transmitter power supplies are transistorized, thus eliminating the need for vibrators. *Motorola Communications & Electronics, Inc., Dept. RTS, 4501 W. Augusta Blvd., Chicago 51.*



For raising and surfacing . . .

Ballast blader and shaper

THE RECENTLY introduced Fairmont W92 Series B Ballast Blader and Shaper is designed for use in connection with track raising and surfacing. This machine will level new center track ballast

700 SERVICE-FREE YEARS!

Hundreds of HURCOLS in service on Class 1 Railroads have run up more than 700 service-free years.

The total replacement parts business from *all* our HURCOL customers totals up to less than the price of two tickets to a Broadway show!

Let us prove the HURCOL'S superiority on your own road.

Features of the HURCOL Rail Lubricator

Still only $392, with two applicators—delivered anywhere

- **Installed in one hour**
- **No rail drilling or other rail preparation**
- **No wear—no contact between wheels and lubricator**
- **Operates at any speeds**
- **Uses standard grease—is easily refilled**
- **Lubricates three miles each way**
- **Can be installed inside or outside of rail**
- **Output easily adjusted by a hand wheel**

Arrange To Test The HURCOL Lubricator At Our Expense.
Ask Us For Details . . .

H. T. KENNEDY COMPANY, INC.
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to the desired depth and plow the surplus over onto the tie ends. With the plow blades reversed in the mounting frame, it will move ballast from outside the rails over into the center track area. The side wing blades will dress the shoulder ballast, or when reversed in the mounting they will move shoulder ballast up onto the tie ends for tamping.

The machine is powered by a six-cylinder engine with a four speed transmission, and has a heavy-duty reverse gear and a chain and sprocket four-wheel drive. One man can operate the unit because, it is explained, the plow and blades are raised or lowered by hydraulic power supplied by a separate air-cooled engine. *Fairmont Railway Motors, Inc., Dept. RTS, Fairmont, Minn.*

Special electric plant . . .

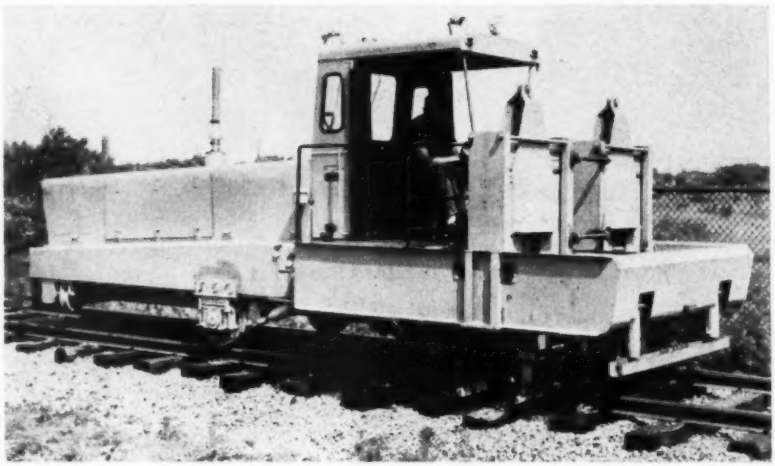
For magnet operation

A NEW KOHLER electric plant is designed especially for electric magnet operation. Designated as Model 7.5CM11, the 7500-watt, dc, air-cooled unit is said to provide ample capacity for 39-in and 45-in magnets. Dimensions and weight have been kept to a minimum to permit ready installation of the plant on cranes of all sizes. The generator is a 7.5 kw, 230-volt dc, four-pole unit with compound winding. Power to operate the generator is supplied by a Kohler Model K660 short stroke, air-cooled, four-cycle engine developing 20 hp at a governed speed of 2400 rpm. The plant features push-button starting. *Kohler Company, Dept. RTS, Kohler, Wis.*

Split head for redesigned . . .

Power Ballaster

THE PULLMAN-STANDARD Power Ballaster has been completely redesigned. Features of the new machine include hydraulic drive and control and a split crosshead mounted out in front of the forward wheels. Adjustable length of stroke and selective tamping depth are other features that are said to add to the versatility of the machine and the effectiveness of the tamping action. The new machine is designed to tamp any raise in any ballast.



POWER BALLASTER now has two tamping heads, mounted out in front, which are independent of each other.

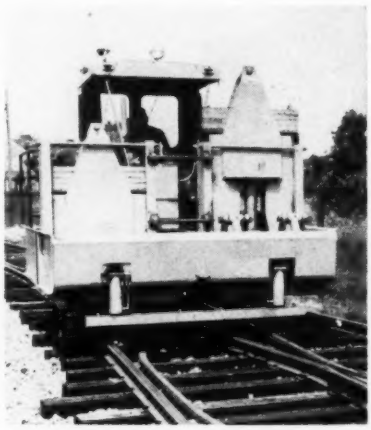
In the interest of reduced maintenance, the machine has been designed with fewer parts and easier accessibility, and lubrication is minimized by oil-enclosed drives throughout. As an example of the extent of the redesign it is pointed out that the machine now has only 18 grease fittings compared with 67 in the old model.

The crossheads, each of which weighs in excess of 3300 lb, are completely independent of each other and each has a separate set of controls. The operator handles both controls with one hand while the other is used to control the movement of the machine from tie to tie. An opening in the floor of the cab gives the operator a clear view of the tamping heads.

A trip valve in the hydraulic system enables the stroke or drop of the crossheads to be varied between 14 in and 28 in, depending on the amount of the raise and the character of the ballast being worked.

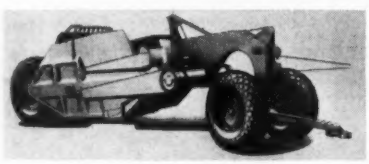
At maximum stroke the crossheads will deliver 36 blows per minute. With a stroke of 16 in the number of blows increases to 54 per minute.

Power is provided by a 75-hp Caterpillar diesel engine, and all controls are hydraulic including the raising of the crossheads. The frame members of the machine serve as a reservoir for the 235 gal of fluid required by the hydraulic system.



The machine is 19 ft 2 in long, weighs 27,000 lb and is equipped with setoff wheels. Spring journal mountings are used on the running wheels.

Jacks for mounting on the machine so that it can carry its own raise are now being engineered and will be offered as optional equipment. *Track Equipment Department Pullman-Standard Car Manufacturing Company, Dept. RTS, 1414 Field Street, Hammond, Ind.*



34-yd capacity in . . .

New tractor scraper

THE AVAILABILITY of a new large-capacity scraper, designed for use with the D8 and D9 tractors, has recently been announced. Designated the No. 491 scraper, the new unit offers increased payload capacity to provide the earthmover with a high-yardage scraper designed to match the power of the large track-type tractor. The No. 491 replaces the Model 90 in the manufacturer's line, and its payload is 82,000 lb—12,000 lb greater than the former model. The new scraper has a struck capacity of 27 cu yd, and a heaper capacity of 34 cu yd, representing a yardage increase of 26 per cent. Another feature of the new model is the increased apron opening which provides 15 additional inches of opening over the prede-

(*Continued on page* 76)

JUDGE IT by the company it keeps

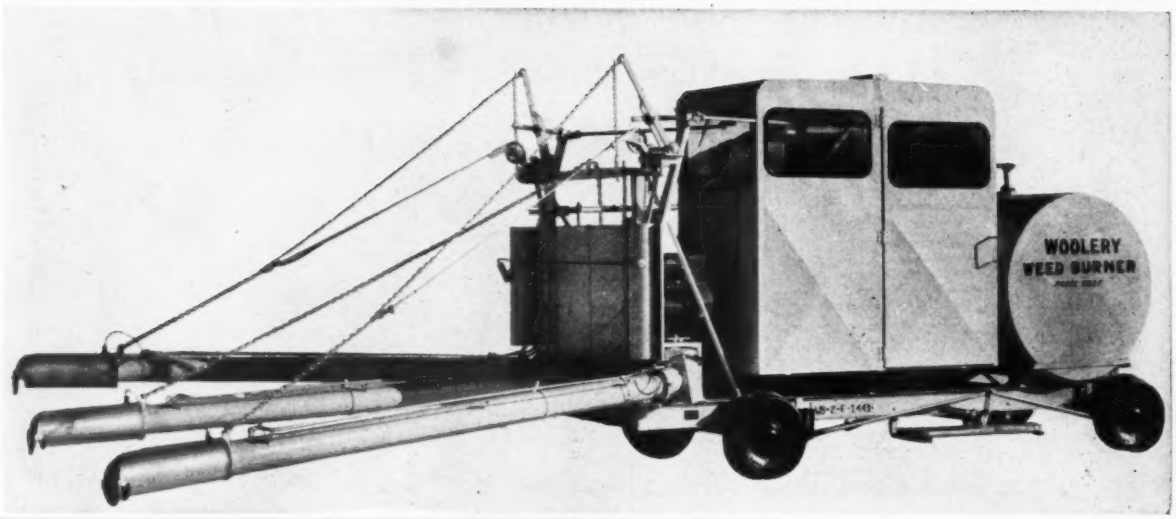
SHVILLE, CHATTANOOGA & ST. LOUIS • ILLINOIS CENTRAL • CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC • ELGIN, LIET & EASTERN • ATCHISON TOPEKA & SANTA FE • BALTIMORE & OHIO • BALTIMORE & OHIO CHICAGO TERMINAL ORTHERN PACIFIC • TEXAS & PACIFIC • CAGO & NORTHWESTERN • ALASKA R. R. U. S. STEEL CORP. • GREAT NORTHERN • T WORTH & DENVER • CHICAGO, BURLINGTON UINCY • DELAWARE & HUDSON • CENTRAL GEORGIA • PENNSYLVANIA R. R. • CHICAGO ASTERN ILLINOIS • MINNEAPOLIS & ST. LOUIS • TERN MARYLAND • MISSOURI-KANSAS-TEXAS ISSOURI PACIFIC • CHICAGO, ROCK ISLAND ACIFIC • ST. LOUIS - SAN FRANCISCO • LEHIGH LEY • BUTTE, ANACONDA & PACIFIC • FLORIDA T COAST • ORINOCO MINING CO. • DELAWARE, KAWANNA & WESTERN • DAVENPORT, K ISLAND & NORTHWESTERN • NEW YORK TRAL • BOSTON & MAINE • CHESAPEAKE & O • DULUTH, MISSABE & IRON RANGE • PS DODGE CORP. • LOUISVILLE & NASHVILLE • UNION PACIFIC • PITTSBURGH & LAKE ERIE • MINNEAPOLIS & ST. LOUIS ASKA R. R.

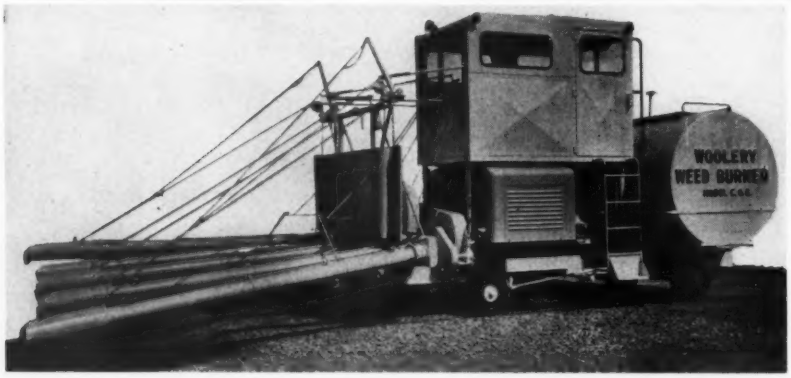
THE JACKSON TRACK MAINTAINER

The list of JACKSON TRACK MAINTAINER users reads like a large portion of "Who's Who in Railroads". And the reason for it is this: *WHENEVER EXPERIENCED TRACK MEN INVESTIGATE, THEY FIND CONCLUSIVE EVIDENCE THAT THE JACKSON TRACK MAINTAINER PUTS UP PERFECT TRACK IN A WIDER RANGE OF BALLAST AND CONDITIONS THAN ANY OTHER TAMPING EQUIPMENT.* Let us furnish you with the complete facts or tell you where you can see these machines in action. How about picking up that phone, right now?

CKSON VIBRATORS, INC. LUDINGTON, MICHIGAN

WOOLERY FOR LOW COST TRACK MAINTENANCE

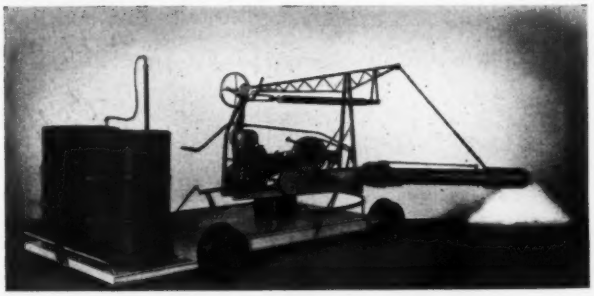




WEED BURNERS

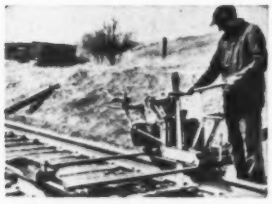
The model WB-2-F (above) has automatic transmission with torque converter; constant blower speed regardless of rate of travel; an all steel cab with safety glass, two entirely separate brake systems and a final drive with chains and sprockets located outside the wheels for easy adjustment. A separate 15-H.P. air-cooled engine is used to drive the blower. Thus when speed is reduced—such as is necessary in yard or snow melting work—the blower speed maintains the same rate and heat intensity.

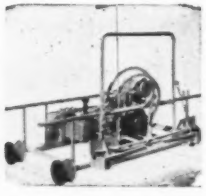
The model COE (above) makes use of a torque converter on the propelling engine which gives any speed desired for burning or deadheading. It burns to a width of 25 feet using all five burners. If desired, a second trip can be made with the two outer arms extended to an additional width of five feet on each side. Burners are under separate and instantaneous control of the operator. The two outer arms can be raised or lowered or can swing in or out to coincide with the contour of the ground. Other Woolery Burners include the Model PB-B, 3 burner portable and the AB single burner portable (shown at right)



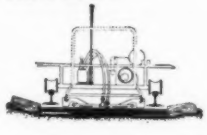
TIE CUTTERS - TIE-END REMOVERS

The Woolery Tie Cutter is a sturdy, light-weight machine that replaces ties with a minimum amount of disturbance to line or surface of the track. A reciprocating saw blade cuts the ties just inside the tie plate on both sides. The center piece is pried out and the Woolery Tie End Remover pushes the ends out thru use of a double-acting, double-ended hydraulic cylinder.





A simple turn of the valve handle causes the two tie ends to be pushed completely clear of the rail.



SPIKE DRIVERS

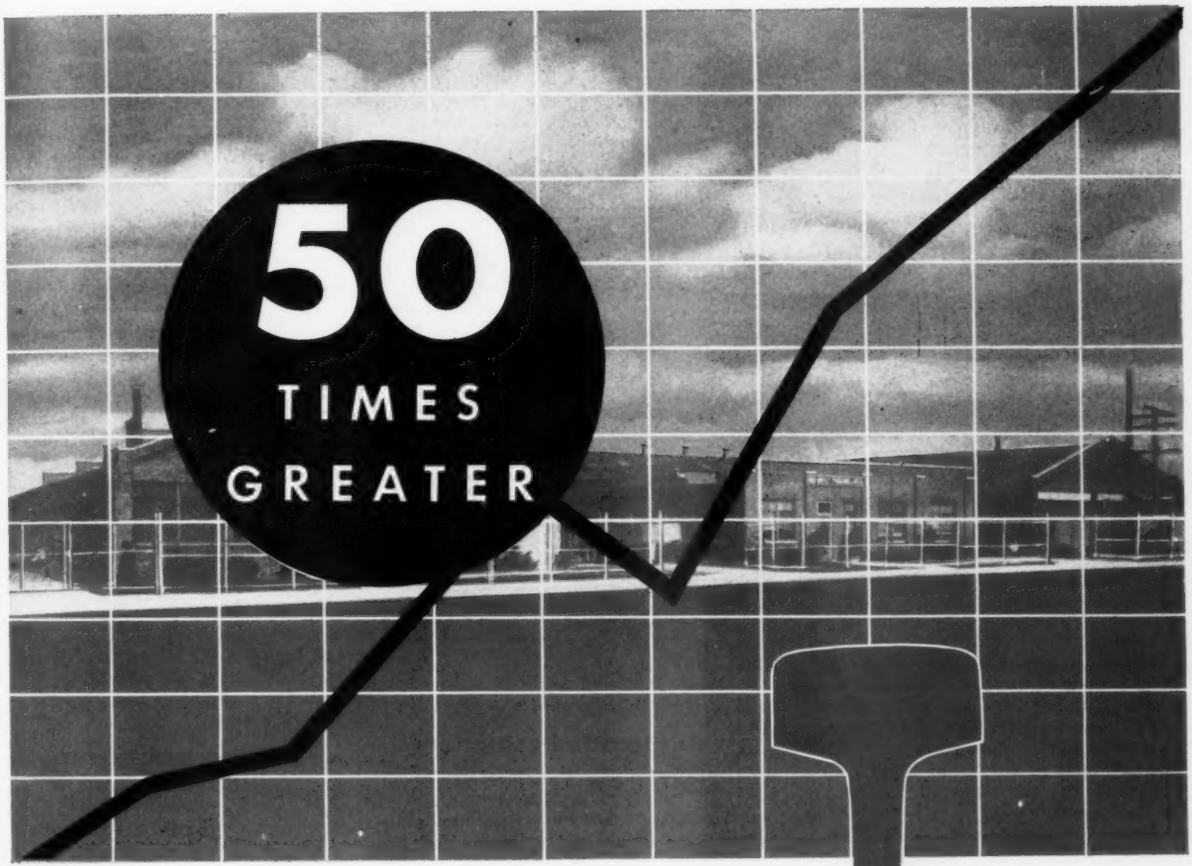
The Woolery Spike Driver is designed primarily for use by tie renewal gangs. Various other pneumatic tools can also be operated with it. Rubber-tired set-off wheels.

WOOLERY MACHINE COMPANY

29th and Como S.E., Minneapolis, Minn.

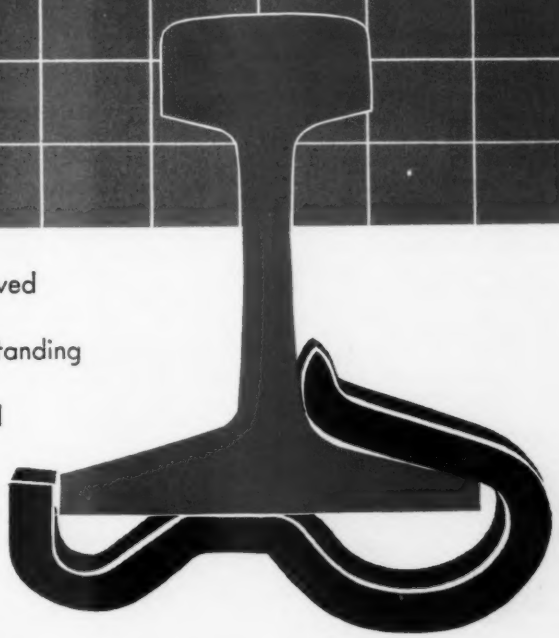
the improved GAUTIER rail anchor

10 years of growth and dependability!



In 1957 there will be 50 times as many Improved Gautier Rail Anchors sold as in 1947*—this rapid growth is excellent testimony to the outstanding quality and dependability of the Gautier. Here is an anchor so carefully engineered and constructed before being put on the market that the original specifications, without variation in either design or material are being used today.

It is truly the finest Rail Anchor on the market.



** the year the Gautier was introduced.*

MID-WEST FORGING & MANUFACTURING COMPANY

General Offices: 38 South Dearborn Street, Chicago 3, Illinois
Manufacturing Plant: Chicago Heights, Illinois

Distributors D. V. MAHER, Cleveland, Ohio; MILTON W. ALLEN, Denver, Colorado; JOHN O'BRIEN, St. Paul, Minnesota; W. T. RICHARDS, San Francisco, California; G. C. HUNT & CO., Atlanta, Georgia

cessor model. Tubeless 24:00 x 29, 24-ply and 27:00 x 33, 24-ply tires are used on the scraper which also incorporates higher bowl sides. *Caterpillar Tractor Company, Dept. RTS, Peoria, Ill.*

New engine has . . .

Weatherproof housing

A WEATHERPROOF steel housing is a distinctive feature of a new Kohler engine, designated Model K660G. The engine is designed especially for applications where protection from the weather is important. It is a four-cycle, air-cooled unit featuring a short stroke, said to give smoother power and longer engine life. It has two opposed cylinders and develops 24 hp at 3200 rpm. Blower and housing are designed with baffles directing a large volume of cooling air around the finned cylinder and head area of the engine.

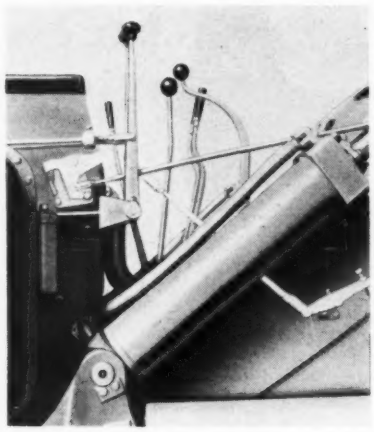
The engine is equipped with a heavy-duty, rainproof silencer-type muffler and gear-type lubrication.

The engine comes furnished with a 5½-gal fuel tank. Weight of engine and tank is 280 lb. The same engine is also available without fuel tank as Model K660H at 260 lb weight for direct-mounted applications. *Kohler Company, Dept. RTS, Kohler, Wis.*

Greater loads for . . .

Scraper combination

HIGHER speeds, greater tractive ability and increased load capacity are being offered in a new four-wheel prime mover and matching scraper combination. The new model, rubber-tired unit is designated as the DW15 tractor and the No. 428 LOWBOWL scraper. The tractor incorporates design changes in several major components, including the engine and power train. A new diesel engine has been designed for the DW15, which develops 200 hp at 2,000 rpm. Also incorporated is a 10-speed transmission which offers working speeds of from 2.7 to 37.2 mph. Wide-section 26.5 x 25, 20-ply tires are offered as standard equipment, increasing the rear wheel tread by 9 in over the previous model. The braking system has also been improved in the new model which has a struck capacity of 13 cu yd and a heaped capacity of 18 cu yd. *Caterpillar Tractor Company, Dept. RTS, Peoria, Ill.*



For traxcavator buckets . . .

Automatic Positioners

AUTOMATIC bucket positioners for the Nos. 955 and 933 Traxcavators have been announced. The bucket-positioning feature, long a standard on the No. 977 Traxcavator, automatically moves the bucket tilt control lever from the tilt-back position to the hold position when the bucket reaches a preset digging angle. The adjustable linkage provided with the bucket positioner allows the bucket to be positioned at any point between an approximate 5-deg digging angle and a 3-deg tilt-back angle.

For No. 955 and No. 933 Traxcavators already in operation, field changeover kits are available. *Caterpillar Tractor Company, Dept. RTS, Peoria, Ill.*

Hydraulic power operates . . .

7-ton mobile crane

FULLY convertible to shovel, crane, clamshell, dragline and hoe is a new construction tool designated Model SP-107. This is a self-propelled machine mounted on a short-coupled, square (96 in by 96 in) rubber-tire carrier with four-wheel drive. No outriggers are said to be required to develop a full-rated 7-ton lifting capacity in all positions of turntable swing. The four-wheel drive is provided along with hydraulic power steering of the wheels on one axle. Optional equipment provides for hydraulic power steering of all four wheels, in which case the wheels on either axle may be steered independently of those on the other axle to provide a close-quarter 15-ft turning radius, or wheels may be positioned in the same direction to permit the machine to "crab" sideways.

The independent travel provides for traveling, hoisting, swinging, and boom derricking simultaneously with each under separate clutch control.

Turntable features include all horizontal power shafts mounted on anti-friction bearings. Each horizontal power shaft is readily removable from the machine as a complete unit.

New hoist brakes increase effective brake-lining area 20 per cent. All spur gears are precision-cut from alloy-steel blanks. The turntable revolves on four sets of combination top and adjustable hook rollers. *Thew Shovel Company, Dept. RTS, Lorain, Ohio.*

'No peeling' with . . .

Special coating

TEDIOUS etching, as well as weathering, of galvanized surfaces of gutters, downspouts, siding, roofing, and heating and ventilating ducts are now eliminated through the use of Galvinoleum. This is a specially formulated coating for application directly to unpainted galvanized, aluminum or terne-plate surfaces with no subsequent peeling. Galvinoleum coatings are available in red, gray, green and metallic colors. Rust-Oleum 575 outside white, or any high-quality oil-base house paint, may be used over Galvinoleum to match a desired trim color. *Rust-Oleum Corporation, Dept. RTS, 2799 Oakton St., Evanston, Ill.*

INDUSTRIAL SALES

Nationally known chemical company needs two men in sales to railroad industry. Primary products are industrial herbicides. Chemical background not essential. Should be under 35. Location Chicago, travel mid-western area. Reply to Box 109, Railway Track & Structures, 79 West Monroe Street, Chicago 3, Illinois.

RACINE
Hydra-Quad TAMPER
(Patent Pending)

Just one man operates this four-tool ballast tamper

Here's a completely hydraulic machine that tamps more track per man per day . . . and does it more uniformly. One operator controls the vertical movement and lateral position of four tampers through two finger-tip hydraulic valves. *Each tamping gun acts independently to insure full compactness of ballast at all points.* All four tamping guns automatically tilt to carry ballast under the tie at proper depth. To accommodate crooked ties, the operator simply swivels the main head.

The Hydra-Quad tamper is easy to adjust for varying rail heights and wider-than-average ties. Each gun is equipped with a quick-change tamping bar holder.

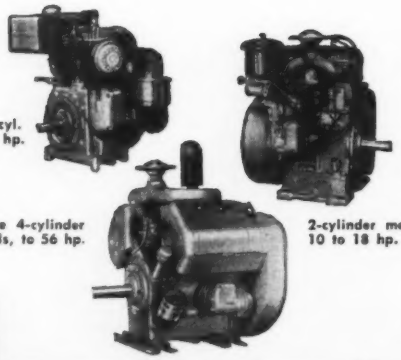
Drop-down and outboard wheels insure easy removal from track. Hydraulic cylinder raises and pivots the machine. Power winch assists in rerailing. Movement from tie to tie is powered by a fluid motor that also operates the power winch.

One more flexibility feature: Off-center outrigger mounting permits two men to operate machines on opposite rails to tamp both tie ends simultaneously. Send for free folder and specifications. Address **RACINE HYDRAULICS & MACHINERY, INC.,** 2038 Albert St., Racine, Wisconsin.

Lease or time purchase plans are available.

RACINE

HYDRAULICS & MACHINERY, INC., RACINE, WISCONSIN

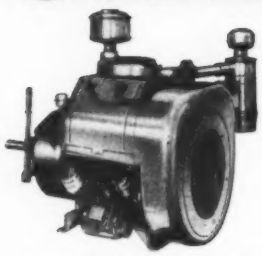


4-cycle single cyl. models, 3 to 9 hp.

V-type 4-cylinder models, to 56 hp.

2-cylinder models 10 to 18 hp.

Torque Champs



New Model VR4D 43 to 56 hp.

WISCONSIN ENGINES

3 to 56 h.p.

Load-Holding Lugging Power! That's what you get when you specify Wisconsin Heavy-Duty Air-Cooled Engines . . . engineered for HIGH TORQUE performance. Here is power that *hangs on* through the shock loads . . . and *carries on* under either variable or constant-load operating conditions.

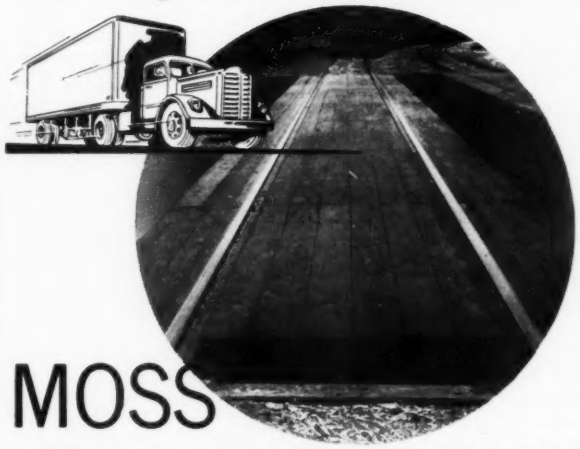
Wisconsin basic HIGH TORQUE design pays off in terms of "Most hp. Hours" of on-the-job heavy-duty service, at all temperatures from low sub-zero to 140° F. Team-up your equipment with Wisconsin HIGH TORQUE Champs — backed by over 2,000 Wisconsin Authorized Service Stations, world-wide. Write for full-line "Spec" Bulletin S-212.

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46, WISCONSIN

Something New Has Been Added...



MOSS

PRESSURE TREATED CROSSINGS

4 Through Bolts Instead of 3 in the Assembled Slab Mean

- **GREATER STABILITY**
- **LONGER LIFE**
- **SMOOTHER RIDING**

It's the latest development in Moss' continuing search for ways to provide stronger, smoother and more durable railroad grade crossings. And that's not all. Moss through bolts are now provided with lock nuts that can't shake loose, even under continuous heavy traffic.

More reasons why Moss Crossings are your best investment!

VERSATILE:

Pre-framed for single or multiple, tangent or curved track. Adapted to crossing through railroad turnouts. Suitable for crossings at any angle with track.

DURABLE:

Built of tough, pressure-creosoted black gum, highly resistant to shock and abrasion, with interlocking grain that gives extra resistance to wear. Many have given 15 and more years of smooth, trouble-free service.

EASY TO INSTALL:

Timbers are cut and fitted to your specifications. Can be installed by a small track gang with regular tools. Easy to move from one location to another.

FOR CROSSINGS THAT LAST AND LAST— INSIST ON MOSS CREOSOTED TIMBER CROSSINGS

WRITE TODAY FOR FREE BULLETIN

T. J. MOSS TIE COMPANY

700 SECURITY BUILDING • ST. LOUIS 2, MISSOURI

CROSS TIES • SWITCH TIES • POLES AND POSTS • PILING • CROSSINGS

WOOD PRESERVING PLANTS: E. St. Louis, Ill.—Granville, Wis.—Shreveport, La.—Columbus, Miss.

trim right-of-way MAINTENANCE COSTS with this NEW HIGH SPEED BRUSH CUTTER!

- ★ Light weight pack back and shoulder carrying position reduces operator fatigue
- ★ More powerful 2.8 h.p. motor designed for continuous, heavy-duty service
- ★ Saw arm elbow and knee joints give operator extra maneuverability and firmer footing
- ★ Lower-cost, easier maintenance . . . "V" belt drive

"Slash" is the word to describe what the new Southworth portable Brush Cutter does to right-of-way maintenance costs. One operator, plus this lightweight, versatile performer, does the work of eight men with brush hooks or scythes. The two big features that make this equipment so valuable are extreme maneuverability and "work horse" power. Exclusive saw arm elbow and knee joints provide easy cutting of brush, trees or limbs at any height within reach. Extra power permits cutting of trees up to 10" and larger, by notching.

The major portion of the Brush Cutter's 39 lbs. is carried comfortably on the operator's back...nature's saddle...where the weight is hardly noticeable. "V" belt drive simplifies field maintenance, eliminates costly repairs, gear stripping, etc. Added features include automatic clutch, finger tip throttle control and large gas capacity for long hours of uninterrupted use. The cutting arm is easily disassembled in less than one minute for convenient transportation. Special 10" heavy duty circular saw is positioned for operator safety.

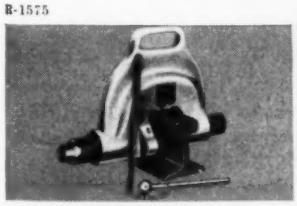
Write for descriptive bulletin and prices . . .

★ **Maintenance Equipment Company** ★

Division of Poor and Company

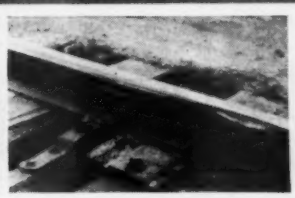
RAILWAY EXCHANGE BUILDING · CHICAGO 4, ILLINOIS

R-1575



VELOCITY POWER RAIL PUNCH
Takes only an instant to punch clean, smooth hole for track bolts. Needs no electricity, compressed air, hydraulic power; operates from small blank cartridge; no open flash or recoil. Only one major moving part, the piston.

MECO RAIL AND FLANGE LUBRICATOR
Doubles to quadruples curve rail and locomotive wheel flange life, by reducing friction between rails and wheel flanges on curves. Also makes possible higher speeds with greater safety.



MACK REVERSIBLE SWITCH POINT PROTECTOR
Prolongs the life of switch points about 4 times; then is reversed and again extends the switch point life for another similar period.

MECO POWER RAIL LAYER
Reduces labor cost to minimum in laying Standard Rails, Long Rails, Continuous Welded Rail. Operates efficiently with large gang of 100 men or more and requires a machine crew of only 3 or 4 men.

ZONE FIREPLATE

U.S. PATENT
No. 2,734,827

FIREPLATE protects simulated bridge from tumbleweed fire. This is a typical test conducted on coatings by the SANTA FE Railroad to determine their effectiveness.

NOW!

COMPLETE FIRE PROTECTION

for Your Railroad's Bridges and Other Wooden Structures!

Developed By The Originators Of The Famous LIBBY-ZONE PROCESS!

FIREPLATE provides:

- positive protection against fire loss
- exceptional protection against drynig, rotting and deterioration
- vast dollar savings on extensive weed control
- easy application

FIREPLATE

Reg. U.S. Patent Office
Serial No. 21278

ENTHUSIASTICALLY ACCEPTED BY RAILROADS COAST-TO-COAST

Now for the first time in the history of railroading, The FIREPLATE Division of The ZONE Company offers complete protection from fire for all types of structures constructed of wood.

For the past 17 years, railroads have been protecting the horizontal surfaces on open deck bridges with the famous LIBBEY-ZONE Process. Now with the development of FIREPLATE, The ZONE Company makes complete protection for wooden trestles and bridges a reality.

The Santa Fe Railroad has played a very important part in the development of FIREPLATE. Through their full scale bridge test, FIREPLATE has proven its value for complete protection against fire. We are proud to announce . . . FIREPLATE HAS PASSED THE SANTA FE FIRE TEST, AND NOW—

THIS AMAZING PROTECTION IS AVAILABLE FOR YOUR RAILROAD'S SAFETY!

You may secure a personal representative to discuss your "FIRE RETARDANT" program without cost or obligation. Telephone or wire us collect, or write ROBERT O. PHILLIPS, GENERAL MANAGER.

Fireplate Division — The Zone Co.

P.O. Box 789—FORT WORTH, TEXAS

ONE-MAN OPERATED CRUISER® CRANE

travels 21.5 m.p.h.

LIFTS UP TO 15 TONS — Here is a fast, one-man operated crane that serves several widely-separated yards — or drives 30 or 40 miles to do a special job, and gets back in the same day. In fact, 21 miles is less than an hour away with this Koehring 205 Cruiser. Its travel is unrestricted — overall width is only 8 feet. Axle-load distribution meets street and highway regulations in most areas — even when carrying 25-foot folded boom.

For all its speed and roadability, this 4-wheel-drive 205 Cruiser has the tractive power to climb 30% grades. It's easy-handling, maneuverable on or off-pavement — turns in 27½-foot radius. Has power-steering, smooth torque-converter drive, big safe air hydraulic brakes. One engine supplies all power for work and travel — one man controls all operations. In addition to fast road speeds, you get a full range of low shuttle-speeds from 0 to 7 m.p.h., for lift-and-carry.

It safely lifts up to 15 tons (based on 85% rating). Butt- or pin-connected boom can be extended from 25 to 70 feet. Or, 15 to 30-foot jib can be added to 65-foot boom. 205 Cruiser handles ½ to ¾-yd. clamshell or dragline, converts to ½-yd. shovel or hoe. Truck, crawler, RailAid mounting also available. See Koehring distributor, or mail coupon.

KOEHRING DIVISION

KOEHRING COMPANY • Milwaukee, Wisconsin

SELF-PROPELLED RAILAID® — Developed especially for the railroads, Koehring 205 RailAid powers its own rail car — travels on-track at speeds up to 20 m.p.h. Crane or excavator loads or unloads itself on ramp-equipped car in less than 10 minutes — sets car on or off-track. Car has 2-axle-drive, airbrakes on all 4 standard-flange wheels. Car-well accommodates 16, 20 or 24-inch crawlers on the Koehring heavy-duty 205 excavator or crane.

mail to:

KOEHRING DIVISION, 3026 W. Concordia Avenue
KOEHRING COMPANY, Milwaukee 16, Wisconsin

Send us 205 data: ☐ Cruiser ☐ truck ☐ crawler model ☐ RailAid

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CITY, STATE.....

K780 RTS

What's the answer?

To be answered in December

Do you have an answer to any of the questions listed below? If so, send it in. Payment—based upon substance and length—will be made for each published answer. If you'd prefer that your name be withheld, we'll gladly comply.

DEADLINE: October 31

1. When working two production tampers in tandem, is it better to have the machines fully tamp alternate ties or have each machine partially tamp every tie? Explain.

2. What is the most effective means of breaking up heavy ice jams at bridges? What precautions must be observed? Explain.

3. To what extent, if any, should railroads pay the dues and other expenses of membership in professional associations (such as the AREA, ASCE, B&B Association, Roadmasters' Association, M/W clubs, etc.) for employees who have shown themselves to be conscientious and interested in bettering themselves? Explain.

4. Is the greater initial cost of installing insulating-type window glass economically justified in railway buildings on the basis of winter fuel savings? What types of buildings can make most efficient use of such material? Explain.

5. What method is most effective in preventing the formation of ice from spillage at and around outdoor locomotive and coach-watering facilities? What personnel safety precautions should be observed? Explain.

Send answers to:

What's the Answer Editor
Railway Track & Structures
79 West Monroe Street
Chicago 3, Illinois

Do you have a question you'd like to have answered in these columns? If so, please send it in.

Use of prefabricated buildings

What are the advantages of prefabricated buildings for railroad service? To what particular applications are such buildings best suited? Explain.

Versatility best advantage

By A. F. AINSLIE
Bridge & Building Supervisor (Retired)
Northern Pacific
Rancho Cordova, Cal.

Prefabricated buildings, and I assume this means metal buildings, have many advantages in railroad service, especially under present conditions when so many changes are being made due to dieselization and the development of new machines and methods for track and B&B maintenance. Due to these changes, buildings that were needed a few years ago are not required or needed at new locations. Prefabricated buildings can easily be taken down and erected in new locations and can be enlarged or reduced in size to fit new requirements. Even insulated buildings can be moved without much loss of material.

Other advantages are that they are fireproof, can be erected quickly by almost any class of labor and their maintenance cost is low. The fact that skilled labor is not required for erection is very important at a time when experienced carpenters are very hard to get. The prefabricated buildings cost more than the material for wood buildings of the same size but this is largely offset by the decreased cost of erection. Normally, maintenance costs are low if the buildings are kept painted so corrosion does not start. While the contents and insulation of these buildings can burn, the metal exterior will frequently keep fires from getting started inside.

Buildings of this type can be used for almost any single-story structure where the size required will permit. They are very satisfactory for various roadway buildings such as pumphouses, section tool houses, material storage, etc. They make good-looking depots for smaller towns or on branch lines where more expensive construction is not justified. At terminals they are suitable for offices, store buildings, pumphouses, diesel oil plants, car-repair shops, service buildings and various other structures. They are particularly desirable for use where welding is being done, such as in car repair and blacksmith shops and for buildings at or near diesel oil stations on account of the decreased fire hazard.

Advantages many

By A. B. WANG
Bridge & Building Supervisor
Monon
Lafayette, Ind.

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(Continued on page 86)

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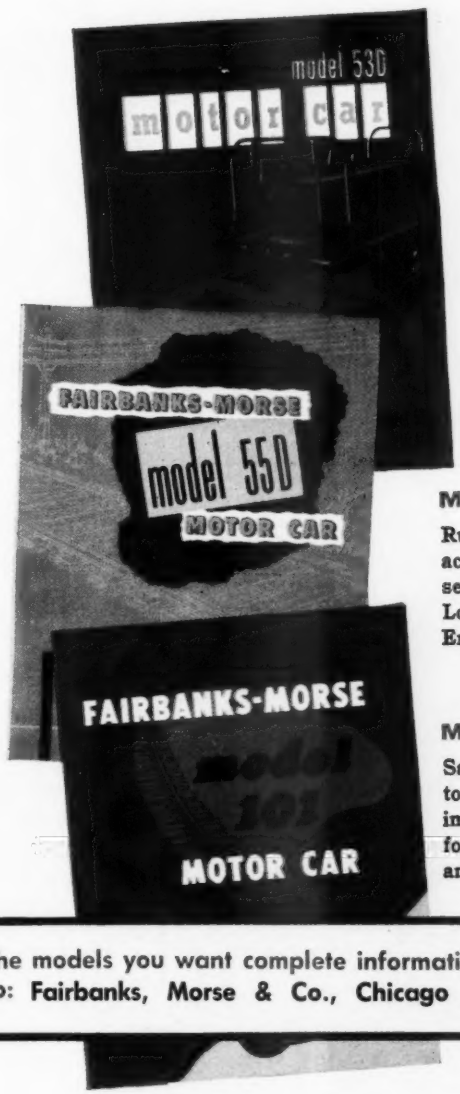

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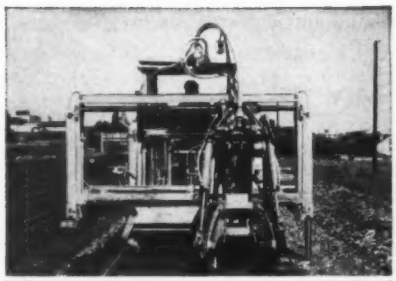
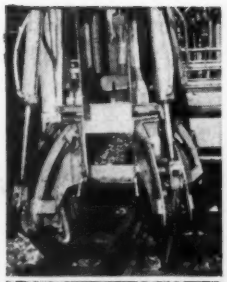
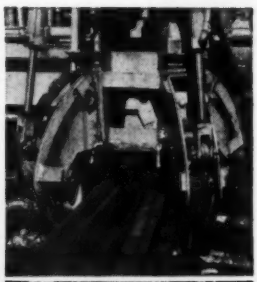


Spot Tamper clamps to rail, either or both lifting cylinders raise track desired amount. Cycle for tampering both ends of tie is about 35 seconds.



At each rail machine tamps at outboard and inboard positions, tamping tools extending under the rail.



Machine will tamp 75% of a turnout. With manifold provided for tamping balance with hand guns.

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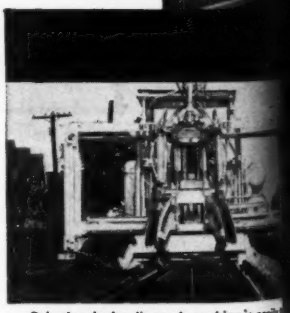

Raised on hydraulic spud, machine is easily for setting-off or changing direction.

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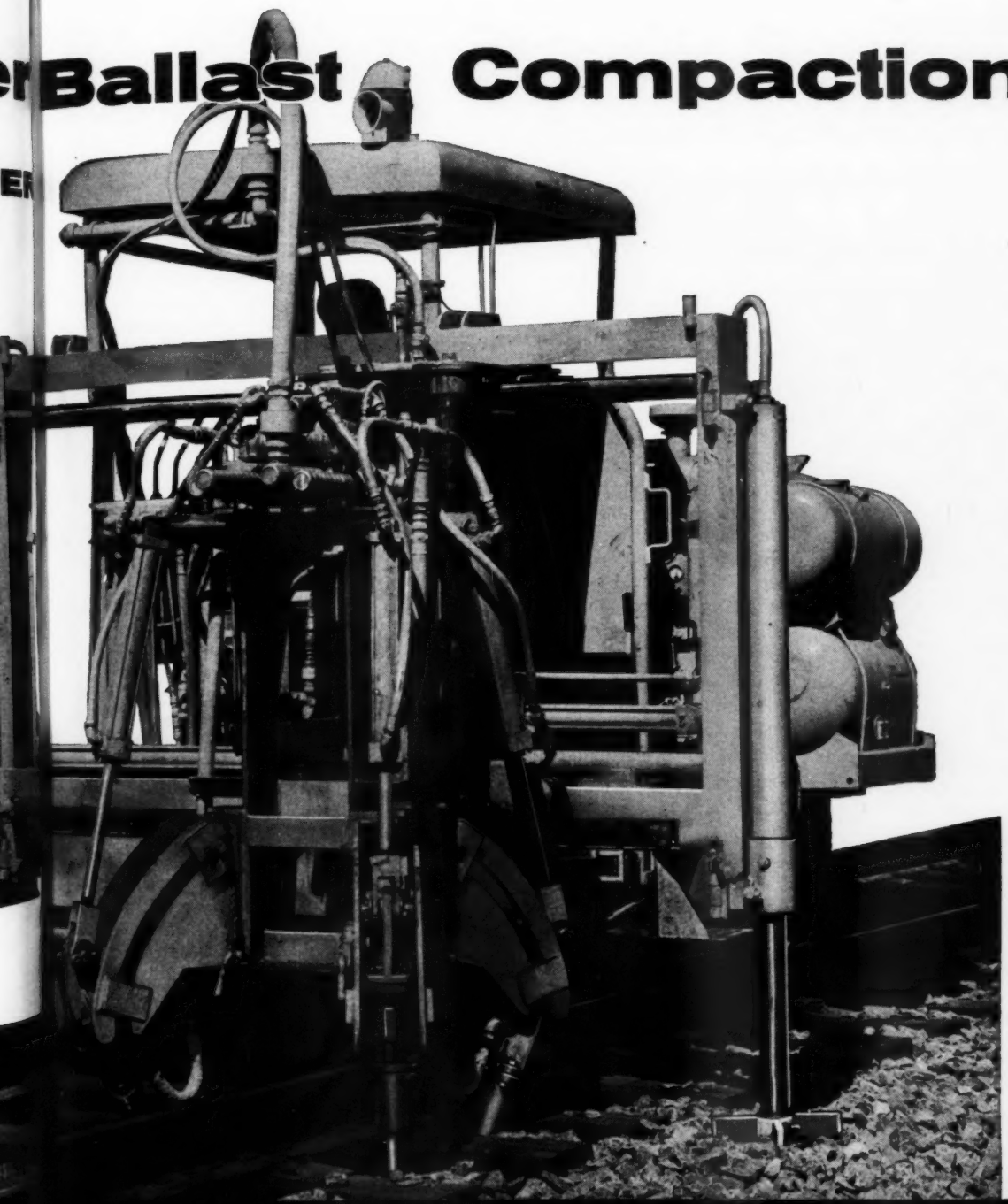

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New R.M.C. Demountable Set-Off, any piece can be carried by one man.

Machine part way out set-off under its own power.

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and insulating board fastened to the metal ribs.

Section houses are provided with rough heavy bins and benches for tools. Metal doors and windows have been found very serviceable. For bunkhouses and depots, wood partitions are provided and water and toilet installations roughed in before the slab is poured. Heating installations can also be made in the floors.

Latest types have metal surfaces protected to the extent that they require no painting.

Turnout from curved main

When installing a turnout from a curved main track where the curvature of the main is approximately equal to the curvature of the turnout and opposite in direction, should both stock rails be bent ahead of the switch point? If not, why not? Explain.

Three possible conditions

By DESIGN ENGINEER (Retired)

Ideally, the installation of a turnout from a curved main under the condition set forth would approximate the installation of a standard equilateral turnout. Theoretically, therefore, both stock rails should be bent ahead of the actual switch point.

Practically speaking, however, the added expense and labor for bending the stock rails (assuming it is not a "custom-built" installation) may not be entirely justified, depending upon conditions at the site. There are, therefore, three separate answers to the question based upon three separate sets of conditions:

(1) Assume (as will be the case in the majority of instances) that the main track is fairly heavily travelled at relatively high speeds and that the turnout track will carry relatively little traffic. In such a case, only one stock rail need be bent at the theoretical point of switch. This should be the rail on the outside of the main track curve. Assuming near-equal curvatures for the main track and the turnout closure rails, the outside main stock rail should be bent to compensate for one-half the switch angle at the point where the switch point and stock rail gage lines intersect.

(2) In a case where both the main and the turnout tracks carry an approximately equal and heavy tonnage of high-speed traffic, the turnout should be treated as a standard equilateral with both stock rails bent as described in (1) above.

(3) But, assume that neither track carries much high-speed tonnage. In such a case, it is doubtful that the stock rails need be bent as the passage of traffic will tend to conform the rails to the desired shape without damaging the switch points.

Likewise, depending upon the importance of the installation, considering both speed and traffic, it may or may not be desirable to install curved switch points. The degree of curvature involved is a factor in this regard also. With rather moderate curvature, straight points will gradually assume a curvature under traffic. This practice should be used only where no high-speed operation is involved. Where extremely high-speed traffic is involved, it might be well also to consider the casting of a special curved frog as well as the curved points.

Stockpiling yard track material

What factors determine the ratio between the number of turnouts in a yard and the amount of replacement material—frogs, switch points, etc.—which should be stored in the yard area? Explain.

No "universal" fixed ratio

By R. V. DANGREMOND
Roadmaster
Elgin, Joliet & Eastern
Gary, Indiana

There are several variable factors that determine the ratio between the number of turnouts and the stored replacement material in a yard area. At the outset, it should be said that each railroad considers them in importance differently so that there is no fixed ratio that would apply to all railroads.

First we must consider that there are actually two separate amounts of materials covered by the question: Replacement materials to cover normal maintenance; and replacement materials to cover emergencies such as heavy damage in derailments.

In many yards these two categories may be considered as one because "emergencies" are rather rare. However, in heavy-traffic, large industrial yards, such as those serving steel plants, this latter item becomes extremely important and must be considered separately from "normal" maintenance. At the outset, a governing factor for the ratio considering normal maintenance is the individual railroad's standard of track maintenance in the yard in question. In other words, is replacement made on the basis of keeping tracks in near-mainline condition or in a condition so that they are just considered safe for traffic? In the former case, less track material is needed in the immediate yard area for annual maintenance.

The kind and amount of traffic in the yard are often governing factors. If the traffic is light and well loaded in revenue cars, less material is required on hand than if the traffic is extremely heavy and loaded in industry buggies or other equipment where spillage and derailments are a problem.

If multiple rail sections are in use in one yard, as is the case frequently, a large amount of replacement material is required to maintain these several rail and switch ma-

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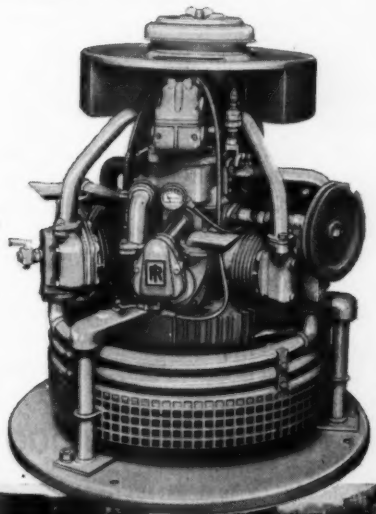

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terial sections. For example, we have several yards in which we have 85-lb, 100-lb, and 115-lb rail and switch sections, requiring a supply of each size rather than a smaller amount of one section if that section were used exclusively.

Rail and curve lubrication is another governing factor. If track lubricators are properly placed and well maintained, a definite reduction in wear results and consequently less material is required for replacement.

Standards of track welding repairs, both electric and acetylene, are other controlling factors. If a well-supervised welding program is in effect, a great reduction in on-hand material requirements can be made.

The kind and availability of material transportation is another factor to be considered. If good transportation exists, together with material-handling equipment available for use at any time, materials can be centrally located, stock items reduced, and materials trucked from the central stock pile for several yards within an area of economical travel distance.

To arrive at a working figure for replacement materials required on hand in a yard area, past maintenance records are most helpful, particularly in yards where few emergency replacements occasioned by derailments are required. However, in the large industrial switching areas, it can only be said that, based on a high frequency of damage, due to derailments, spillage, and fires, a high inventory must be held on hand in the area to eliminate extremely costly delays to production.

There is one other factor that must be faced and is not the least in the determination of "on-hand" material requirements. That is the financial status of the railroad, notably in relation to the maintenance-of-way department. This factor changes from year to year in line with business. Normally the resulting change in the ratio of materials "on hand" has no adverse effect. However if the situation threatens to become serious the supervisor must depend upon his ingenuity to do his best with what he has at hand.

Fueling locomotives indoors

Is it practicable to fuel diesel locomotives indoors? What are the advantages? Disadvantages? What precautions must be observed? Explain.

Outdoor facilities better

By A. H. Malenke
Superintendent of Shops
Great Northern
Spokane, Wash.

We can see no advantage to fueling diesel locomotives indoors. There is a disadvantage for the reason that here at Hillyard shops we fuel and sand our diesels at the same time at the outdoor fueling and sanding station.

If the diesels were fueled indoors, considerable space to handle all of the units at the same time would be required. There would also be a loss in time. Then again, the fueling of diesel engines indoors, in our opinion, would create a fire hazard.

At our fueling station outside, we can fuel four units at once.

Have several objections

By W. F. Dadd
Superintendent, Locomotive Maintenance
Baltimore & Ohio
Baltimore, Md.

Indoor fueling is not a practice in any of the shops on our railroad. However, it has been given consideration in several instances, and a review of other railroad installations of this type indicates the following:

Fueling indoors is generally associated with the shopping of the locomotive, which in many cases results in fueling columns or connections being used at depressed floor and work platform areas. This changes the relationship between the man fueling the locomotive and the locomotive fuel connections, which in some cases are raised to head level and beyond making it more difficult to attach the fueling nozzle to the locomotive.

Fuel hose and standards become a hazard due to being located in an area where considerable other work is performed. The hazard presented by fuel leaks is, of course, more pronounced inside a building and while we have no such applications, I would presume this would be considered an additional insurance risk and might possibly require building changes to improve fireproofing and possibly greater fire protection than is normally assigned to a shop building. Where such a fueling facility was the only one at a terminal and was located inside a building this would normally require additional handling time in getting the locomotive to the fuel facility.

The only type shop for which inside fueling facilities should be considered is a straight-through type building, which is located in the normal path of locomotives coming into and going out of the locomotive service shop area. The roundhouse type shop would not lend itself readily for the use of inside facilities for many obvious reasons. The trend on railroads has been and should continue to be aimed at keeping the locomotives out of the shops as much as possible, and I am sure requiring a locomotive to go into a shop building for fuel would only add to the total out-of-service time for the locomotive.

Not practicable in south

By W. H. Mims
Superintendent Motive Power & Equipment
Central of Georgia
Savannah, Ga.

On a railroad in a southern climate, such as ours, it is not practicable to fuel diesel locomotives indoors. Weather conditions are never too cold nor is there ever too much snow and ice to make fueling impractical out of doors. The only advantages that we could see in fueling locomotives indoors would be the reverse of the above conditions—that is, if the temperature were too low or if there was much snow and ice around causing it to be very

(*Continued on page* 92)

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killers are the only practical way to keep ballast clean. They help obtain proper drainage, reduce heaving, keep track circuits free of vegetation.

But what about the rest of the right of way? Clean, clear ways mean better visibility at grade crossings and around curves. They give passengers a more attractive view and make you a better neighbor to farms and towns. Communication lines and signal systems remain clear of dangerous brush and weeds.

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For more information about how Dow brush and weed killers are a vital part of modern railroading . . . and the name of a qualified applicator . . . write to us today. THE DOW CHEMICAL COMPANY, Agricultural Chemical Sales Dept., Midland, Michigan.

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uncomfortable or practically impossible to fuel locomotives.

The disadvantages of fueling locomotives indoors are many. One primary disadvantage would be the cost of a suitable structure. Such a structure would have to be fire resistant and we feel that such monies could very easily be diverted to more useful means. Another disadvantage would be the fire hazard, for if a fire occurred in a building where locomotives are being fueled, there would be the possibility of losing both the building and the locomotives that were in it at the time. There is also the disadvantage of having to supply some type of ventilation equipment to carry off both fuel and exhaust fumes. The precautions that would have to be observed would be as follows:

In order for insurance underwriters to give adequate insurance on both locomotives and buildings, the building would probably have to be of fire resistant construction. It would also probably have to be sprinkled and well supplied with many dry powder and CO^2 fire extinguishers. Suitable sumps would have to be constructed within the building to carry off any fuel spillage that occured in it. A "no smoking" rule would have to be enforced throughout the building. Heat would probably have to be furnished in the building and this would either have to be steam heat or Underwriters approved electric heat. Precautions would have to be taken against the explosion hazard that would be present inside a building because, if the fuel-air mixture reached a point in the building so that it would be explosive, a disastrous explosion could occur from this mixture being ignited by the disel exhaust.

Our thinking is that there are very few advantages to fueling diesel locomotives inside a building and these are more than outweighed by the many disadvantages.

All-welded railroad bridges

Is all-welded construction practicable and economical for steel railroad bridges? Does it have advantages over riveted or bolted construction? Disadvantages? Explain.

Practicable sometimes

By W. R. WILSON
Assistant Engineer
Santa Fe
Chicago

The answer to these questions depends, as do so many engineering problems, on the situation.

Welding is practicable when it can be done under good conditions, such as in a shop with jigs for fitting up and holding the component parts in line, provisions for turning the work to give the best welding positions, and the use of automatic welding machines.

The elimination of connection angles and the extra metal required to compensate for rivet or bolt holes in tension members will reduce the weight of steel in a welded bridge. The difference in fabrication cost between welded and riveted construction will often be determined by the organization and equipment in the steel fabrication shop.

Some of the advantages of welded construction are: (1) On plate girders or coverplated beam spans there are no rivets to interfere with placing the open-deck ties or ballast-deck timbers; (2) the details on welded bridges can usually be simplified over those on riveted or bolted bridges; (3) where the securing of a minimum dimension, base of rail to clearance, is a factor, beam spans with a steel plate deck will give such a dimension; (4) the welded deck plates and steel curbs can be made watertight or can be covered with membrane waterproofing; (5) rigid-frame bridges of welded construction can be used where clearances govern (on such a bridge welded joints can usually be designed to take up less space and function more efficiently than riveted joints); (6) both fixed and expansion shoes can be made by welding plates or slabs together, and this type bearing cheaper than cast steel shoes; and can be secured more quickly and (7) welded bridges lend themselves to architectural treatment for structures where good appearance is essential. Welded steel handrailing can be made in many designs and will add to the attractiveness of an underpass.

Some of the disadvantages of welded construction are: (1) It takes more time to erect a bridge using welded connections. With the adoption of high strength bolts and either torque impact wrenches or the "one turn of the nut" method, erection time can be shortened. Time is usually very important in railroad bridge erection to get rid of slow orders as soon as possible. (2) It is necessary to have close inspection and the work done by qualified welders. (3) If the proper sequence of welding is not followed, the heat of welding can warp the members or, if prevented from warping, it can cause locked-in stresses in the steel.

Welding is an excellent method of repairing existing bridges. It is usually much faster than riveted work, requires less equipment on the job, and uses less steel.

Editor's note: A thorough discussion of this question was submitted by Dr. Shu-T'ien Li, consulting engineer, Mobile, Ala. Dr. Li's discussion will be presented as a feature article in a forthcoming issue of *RT&S*.

Certainly practicable

By J. E. SOUTH
Assistant Chief Engineer—Structures
Pennsylvania
Philadelphia, Pa.

All-welded construction is certainly practicable for some types of steel railroad bridge and there appear to be no reasons why any type could not at least have all-welded components. It is quite possible that the best construction in many cases will be the use of all-welded components with field connections made with high-strength bolts. These are things that will only be developed as more all-welded railroad bridges are constructed.

The designer of an all-welded railroad bridge must realize that, to obtain a satisfactory structure, the bridge must be designed for weld-

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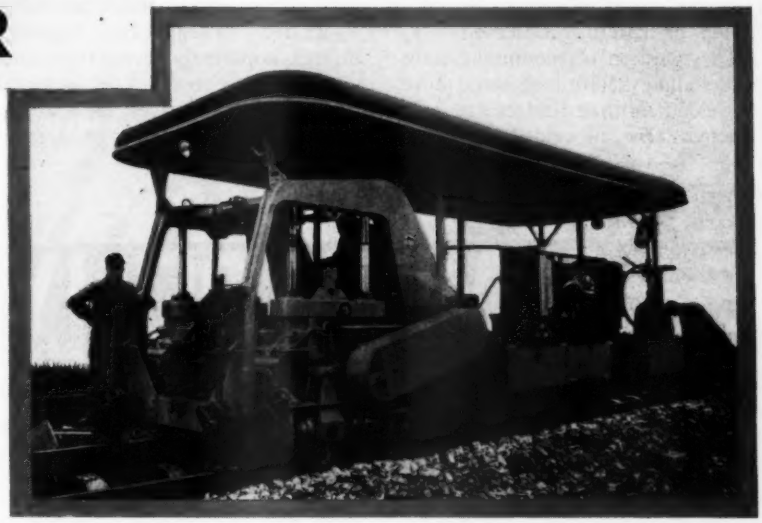
says Canadian M/W Engineer



". . . the total time to tamp 11 rails with 24 ties to panel was 22 minutes for one insertion . . . It would appear that the machine was capable of tamping 1100 feet of track (per hour) if given complete freedom to work. To date the track has stood up well."

The PLASSER VKR-01 HIGH CAPACITY HYDRAULIC TAMPER is the latest development in track maintenance, incorporating hydraulic drive and control. It assures highest performance, accuracy and simple handling, resulting in absolutely uniform compacting of ballast.

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ing, not as a rivited bridge where welds are substituted for rivets as fasteners. Both for economy and satisfactory performance the requirements of the American Welding Society Specification for Welded Highway and Railway Bridges should be carefully observed.

The question of economy cannot be definitely determined until more all-welded railroad bridges are constructed. One all-welded bridge on the Pennsylvania at Mulberry Street in Baltimore, Md., built in 1952, indicated a saving of about 15 per cent over an all-riveted bridge. A recently purchased all-welded 65-ft deck girder span showed a saving of about 25 per cent over a similar riveted span for which bids were taken at the same time. Many of the state highway departments are using all-welded design for highway bridges, apparently having been convinced of the economy of welding.

As to the advantages, the absence of rivet heads and fewer parts gives a cleaner structure which is easier to paint and maintain. If a more economical and satisfactory bridge can be obtained by welding, this is sufficient justification for its use.

What disadvantages there are to the use of all-welded bridges cannot be forseen but will remain to be developed as more experience is obtained.

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Economy has been proven

By J. F. Marsh
Designing Engineer
DeLeuw, Cather & Co.
Chicago

The welded highway bridge has become an accepted type of construction today, while the all-welded railroad bridge is still uncommon in the United States.

Several developments have taken place recently which may tend to alter the thinking of railroad bridge engineers with regard to welded bridges. The steel mills are now in a position to furnish a weldable structural steel for bridges which limits the carbon and manganese content and assures a fully-killed steel in thicknesses over 1 in. The fabricating shops have developed the submerged-arc welding process whereby most of the shop welds in a built-up beam or girder can be done by machine. The specifications of the American Welding Society have been continually revised to encourage the use of welding in railroad bridges. Recent fatigue tests of all-welded beams show increasing evidence that if design stresses are within allowable values, the heavy live load and impact concentrations taking place in a railroad bridge will not shorten the fatigue life of the structure. Many stress-raisers have been eliminated through improved design and increased attention to detail.

In the case of deck spans beyond the range of rolled beams, the use of all-welded construction has proven to be economical. In a recent instance both riveted and welded girders were designed for the same railroad bridge. The material and fabrication cost of the all-welded bridge was 25 per cent less than for the riveted bridge and the estimate weight 20 per cent less.

The railroad deck-plate girder is

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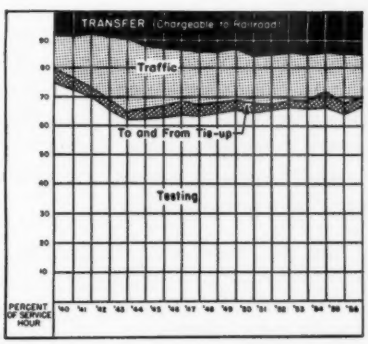

Notice in the chart that the lowest percentage for testing within a single service hour is better than 60%; with a high of 75%. Never, in the past 14 years, has it been below 60%.

Group testing is a procedure that benefits all who use it. Yet it is only one of the extra advantages of Sperry Rail Service. The efficiency of Sperry equipment and personnel, which results in the detection of more and smaller defects . . . assures the safety and soundness of millions of miles of rail in track.

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easily adapted to welded construction. The flange plates can be automatically welded to the web plate with an excess of strength. Bars may be used for stiffeners instead of angles. The flanges may be "tailored" to the computed stresses. To obviate field welding in splices and connections, high-strength bolts and carbonized washers may be used. In cases where depth is limited, such as railroad highway underpasses, the all-welded girders should prove practicable and economical.

It appears the principal disadvantage of all-welded construction is the lack of definite knowledge with regard to the expected fatigue life of the structure under traffic. The possibility of poor field welding in assembling the structure is also a factor to be considered. Lack of design specifications and hesitancy in the past of the fabricating shops to expand their welding facilities have been deterrents to welded construction.

Continued research in the behavior of welded structures and increased knowledge made available to railroad bridge engineers will increase the use of welding. The economy of all-welded railroad bridges of medium span length has already been proven.

Practicable and economical

By L. P. DREW
Assistant Chief Engineer
Union Pacific
Omaha, Neb.

All-welded construction is not only practicable but economical for steel railroad bridges and has been used in a number of cases. On the Union Pacific we have 12 spans of deck-plate girders of all-welded construction which are now in service under branch-line traffic. So far, no evidence or signs of disintegration, overstress or deterioration have appeared. These spans were fabricated entirely from plate and machine welded with continuous automatic welding machines. Test samples show adequate penetration of the welded metal into the main material without undercutting. The design specifications were the same as used for riveted spans. Calculated and scaled weights show from 6 per cent to 10 per cent saving in metal. In addition, the price of plate is usually slightly less than rolled shapes.

Some of the advantages over riveted or bolted construction are that none of the sections of the main material need be deducted for rivet holes since there are none. Likewise there are no rivets, either shop or field, that will later work loose and have to be redriven. The details and connections are much simpler than for riveted work and, therefore, eliminate a large percentage of shop detailing which in turn reduces cost.

The chief disadvantage is that all-welded construction is only applicable to spans which can be completely fabricated and assembled in the shop, shipped to the site and erected in one piece without any field connections. It is therefore necessary that heavier erection equipment be available than is required for riveted spans.

(*Continued on page* 100)

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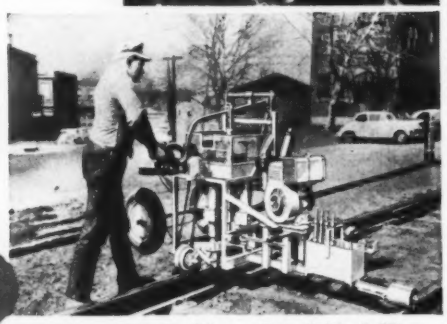

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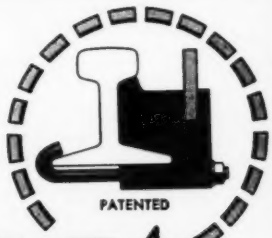

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HARNISCHFEGER
Construction & Mining Division
Milwaukee 46, Wisconsin

What's the answer? (cont'd)

Governed by many factors

By Jos. A. JORLETT
Engineer—Structures
Pennsylvania
Baltimore, Md.

Even limiting this reply to steel bridges carrying railroad train loads, there are enough examples of all-welded construction in this country and in foreign countries—particularly Germany—to claim that such construction is practicable and economical. Why then, might one ask, are not more bridges of all-welded construction? The answer might be found in the designing offices of our railroads.

The general requirements as to arrangement of parts, unit stresses of base material, camber, clearances—aside from the calculation of loadings—for welded structures are found in AREA specifications and in many railroad specifications. Most detailers of steel structures are converts from riveting practices and one of their earlier mistakes was to use many fillet-welded lap joints rather than butt joints in joining parts. Fundamentally, weld metal is expensive and all other factors being equal the welded design with the least weld metal is the most economical.

In the early stages of structural welding, fillet-welded strap splices for webs and flanges of girder assemblies were most commonly used. Where butt welds were used they were not depended upon to carry full stress. Now the requirement is reversed. Full-scale tests show that butt joints are more efficient, this being so because butt welds provide a smoother path for stress lines and reduce the number of stress raisers present in any assembly. In the design of welded structures, most any type weld is permissible except the use of saddle welds (except for sealing) and of intermittent butt welds made from one side only without backing.

The problem of the designer of a welded structure is to plan not only for the judicious use of welds but also for the use of materials, controlled procedures and sequences of welding. The use of large rolled I-beams rather than many built-up members, and the use of weldments from plates or other rolled steel products are money savers. Welds should be planned at points of least cross section or least load in the members so as to reduce welded metal costs. Placing the welds in the most accessible locations and in the most favorable positions and the use of bolted field connections will often reduce costs.

Controlled procedures and sequence of welding for splicing rolled beams and built-up plate girders are also essential to insure against shrinkage, stresses and deformations. This is obtained by permitting any part of the member to move that offers restraint against the contraction of the heated base metal when it is cooling. It is essential that the shrinking of the heated part must not produce any harmful stresses. This is done by other parts moving or deforming properly.

Railroad structures must withstand high impact due to suddenly applied loads. The use of proper steels and welding electrodes is ex-

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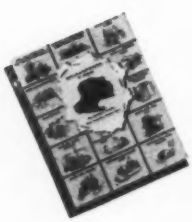

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More and more railroads are choosing Bulldog Rail Anchors

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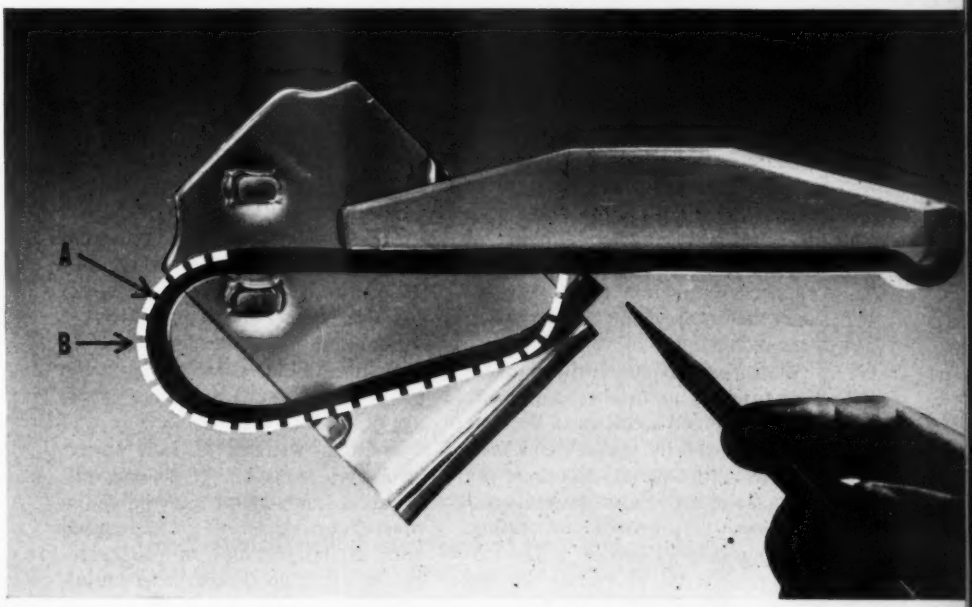
To meet this demand, True Temper's plant at Lake City, Pennsylvania, is turning out anchors by the millions. Because we use modern, automatic methods to manufacture BULLDOG anchors under rigid quality-control conditions, orders are being shipped promptly.

For the full story — or if you would like to test the BULLDOG anchor on your own right-of-way — call or write True Temper, Railway Appliances Division, 1623 Euclid Avenue, Cleveland 15, Ohio. There is no obligation, of course.

FAST APPLICATION comes from improved BULLDOG design. New contour of spring raises point (A on transparent model) where hammer strikes. This keeps force in a straight path along top of spring, requires only one or two hammer blows to install. Old design (dotted line B) dissipated some of this force.



HIGH HOLDING POWER is achieved with two-way compression grip and great spring tension. Broad, flat tie-bearing surface transmits load over a wide area. Anchor does not bear on tie plate — cannot loosen plate or disturb spike.

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What's the answer? (cont'd)

tremely important. At present, the engineering profession is studying specifications for steel that permit welded structures to become brittle at low temperatures. Several failures have occurred not only in welded structures but in reinforced concrete structures because of this factor.

Efficient use of material is also the function of the designer. Small parts can be designed from left-over parts to minimize the amount of scrap. Original cuts of metal should serve as the edge preparation of the member parts. Normally at least 75 per cent of the original value of a pound of material is lost when it becomes scrap. Railroads have been using welded procedures for repairing and increasing the strength of their steel structures for more than 30 years. Rolling equipment incorporates welding techniques and practices to a great extent. It appears the employment in new structures is lagging.

Workmanship and inspection are of first-degree importance in securing properly welded structures. Welders must be carefully trained and their work tested frequently to assure the adequacy of the welds. Material must be properly prepared by fitting, grooving and placement. The inspector must be constantly on the job to observe the welding—the proper method of passes where necessary, the chipping and gouging to remove slag and imperfections—and to measure the size and kind of welds. An inspector need not be a skilled welder, but he must be familiar with the practical as well as the technical aspects of welding.

Designers trained in riveted construction are amazed to find that there is more extensive application of corrective measures permitted by specification in welded structures. Many circumstances arise where quite extensive correction may be permitted without jeopardizing the strength or structural value of a member or a frame if the correction is properly planned and controlled and suitable procedures are used.

Shop and field painting economies are found in welded construction. It is best to omit all paint in the shop. The priming and field coats are best applied after all welding has been completed during erection. This will sometimes require sandblasting or flame cleaning and dehydration in the field. This may be a blessing, however, in obtaining longer-lasting field-painted protection. Corrosion resistance must be given proper consideration. Where weld metals differ chemically or metallurgically from the base metal, attacks may occur at or adjacent to the welds under certain conditions of exposure. Studies are being made of the proper preparation and coverage of welded surfaces.

In field welding of long superstructures, transverse joints and substringers and metal grating floors present problems of great importance in the planning of proper sequences to keep shrinkage to a minimum in lines of continuous members. Welding of flooring may cause lateral bending of floorbeams or buckling of longitudinal members.

This reply hopes to show that the practicability and economy of an all-welded structure is governed by many more factors than the pound saving in material.

Biographical briefs (cont'd)

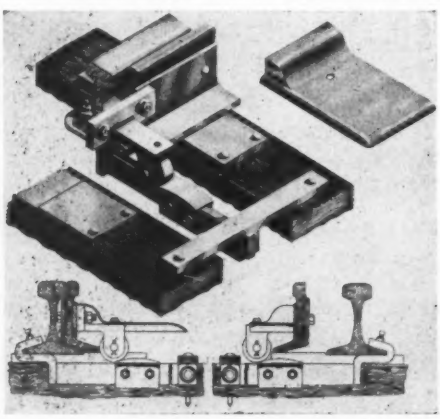
(*Continued from page* 26)
division and in 1956 was promoted to assistant district engineer at Quebec City —the position he held at the time of his recent pomotion.

Burton J. Worley, 39, whose promotion to assistant division engineer—signals and communications of the Milwaukee Road at Chicago was recently announced (*RT&S*, July, p. 30), graduated from Iowa State College and joined the Milwaukee in July 1939 as a rodman at Chicago. He subsequently served as instrumentman at Chicago, assistant engineer at Butte, Mont., assistant division engineer at Butte, division engineer at Aberdeen, S. D., and as division engineer at Chicago—the position he held at the time of his recent promotion.

Walter E. Fuhr, 40, whose promotion to principal assistant engineer on the Milwaukee Road at Chicago was recently announced (*RT&S*, July, p. 30), graduated from Iowa State College and joined the Milwaukee in September 1941 as a rodman at Miles City, Mont. He subsequently served as rodman and instrumentman at Ottumwa, Iowa, instrumentman at Mason City, instrumentman and assistant engineer at Aberdeen, S.D., and assistant division engineer at Mason City Iowa, until Feburary 1948 when he was promoted to division engineer at Ottumwa. He was transferred in that capacity to Miles City in January 1950 and in September 1951 was appointed division engineer at Savanna, Ill.— the position he held at the time of his recent promotion.

Robert C. Weller, 36, whose promotion to division engineer on the Canadian National at Hornepayne, Ont., was recently announced (*RT&S*, July, p. 30), graduated from the University of Toronto and began railroading with the Algoma Central in May 1947. He joined the CNR in June 1953, as an assistant engineer and, at the time of his recent promotion, was assistant division engineer at London, Ont.

Paul Martin, 46, whose promotion to system methods engineer on the New York Central at Cleveland, Ohio, was recently announced (*RT&S*, July, p. 30), graduated from St. Mary's College and began railroading with the C&NW in September 1937 as a welder helper at Chi-



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One test which demonstrated the value of rail and flange lubricants was made on a 45.63 mile stretch of track in a Rocky Mountain state. There were 21.36 miles of curved track on the run. Average curvature was 6.13°. Total included angle was 6,924°. Elevation gain was 3,775 ft. Maximum grade was 2%. The same train of 32 cars and locomotive was used for the test runs which were made before and after the track was lubricated.

With track lubrication, the test disclosed, curve resistance was cut in half. About 96 feet of elevation were gained and an increase of 2.6% in tonnage rating was obtained.

Conclusions reached from this test were that, with track lubrication, substantial improvements in operating efficiency are possible. These can be utilized in three ways:

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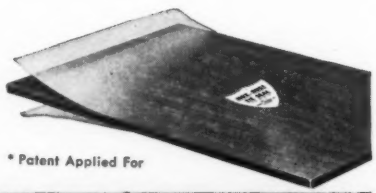

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Biographical briefs (cont'd)

cago. He subsequently served the C&NW as division work equipment inspector, general scale and work equipment inspector and work equipment shop foreman until 1950 when he joined the D&RGW as superintendent of work equipment at Denver, Colo. In 1953 he joined the Dow Chemical Company at Denver as superintendent of service, returning to the D&RGW in 1954 as superintendent of work equipment. In 1955 he joined the New York Central at Cleveland as superintendent of maintenance equipment system—the position he held prior to his recent promotion.

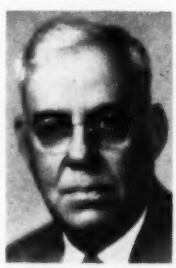
J. F. Warrenfells, Jr., 43, whose promotion to chief engineer of the Jacksonville Terminal, was recently announced (*RT&S*, June, p. 24), received his degree in civil engineering from the International Correspondence Schools and began railroading in September 1942 with the Seaboard Air Line as assistant to the division engineer at Savannah, Ga. He subsequently served as assistant division engineer at Savannah, assistant master carpenter at Atlanta, master carpenter at Savannah, and principal assistant division engineer at Raleigh, N.C.—the position he held at the time of his recent promotion.

Fred S. Barker, 36, whose promotion to division engineer on the Canadian National at Montreal was recently announced (*RT&S*, July, p. 30), graduated from the University of Toronto and joined the CNR in May 1949 as an instrumentman at London, Ont. In April 1952 he was named assistant engineer at Ottawa, and in December 1954 was promoted to assistant division engineer at Montreal—the position he held at the time of his recent promotion.

Guy S. Smith, 67, whose retirement as division engineer on the Missouri Pacific at Coffeyville, Kan., was recently an-

Paul Martin
NYC

Fred S. Barker
CNR



Guy S. Smith
MP

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Why not let one self-propelled machine, with a one-man crew, handle most of your right-of-way maintenance? It's not only possible — it's happening every day on those lines which use a modern Adams motor grader to keep right-of-way in first-class shape.

The Adams is a versatile off-track tool. It goes by most direct route to the next job. Machine crosses tracks, ties, switches, without damage — follows right-of-way embankment, or rides highways to make maximum use of speed. Grader has 8 forward speeds to 25 mph (11 with 3 optional "creeper" gears). It has 4 in reverse — to 13 mph — for fast backup in shuttle grading.

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All 6 models in the Adams line are rugged, heavy-duty rigs — with plenty of weight to hold big blade steady — extra horsepower to handle hard-to-work materials. Optional equipment extends grader's range of usefulness. *Scarifier* rips out old asphalt, hard-packed dirt, roots, and stones. *Snow plow* and *wing* keep travel routes clear in winter months. *Dozer blade* pushes debris off right-of-way, backfills around culverts, cleans up spillage in yards.

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With an Adams, you can plan on a big lift in your year-round right-of-way maintenance from only one man and this one machine. You'll find it's easy to operate on a fixed schedule — detect and fix small troubles before they become major problems. One man, on one grader, handles dozens of RR jobs ... with no extra worry on your part about shovels, draglines, flatcars, gang cars, big work crews.

Use this modern grader to cut and clean ditches, slope banks, widen shoulders, spread ballast, level fills, grade access roads, build grade for sidings, remove brush and weed growth. In your yards, the Adams can clean up around water towers, coal docks, shops, all types of stockpiles.

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*Choice of Cummins or General Motors engines.
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GEARED TO PROGRESS
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Biographical briefs (cont'd)

nounced (*RT&S*, July, p. 30), graduated from the University of Kansas and joined the MP in May 1912. In 1917 he was named assistant engineer at Van Buren, Ark. After serving in that capacity at various locations he was named assistant division engineer at Hoisington, Kan., in 1926. He subsequently served as division engineer on the Illinois, Louisiana and Joplin—White River divisions. From 1941 until 1944 he served as assistant superintendent of the Joplin-White River division and in the latter year was named division engineer at Coffeyville—the position he held at the time of his retirement.

John A. Carey, 30, whose promotion to assistant division engineer of the New York Central at New York, was recently announced (*RT&S*, May, p. 32), graduated from Clarkson Institute of Technology and joined the NYC in September 1952 on the engineering corps at Albany, N. Y. He subsequently served as junior engineer and assistant methods engineer at Albany, Utica and New York until June 1956 when he was named assistant supervisor bridges and buildings at Jackson, Mich.—the position he held at the time of his recent promotion.

Simeon G. Wintoniak, 38, whose promotion to engineer—structures on the Pennsylvania at Chicago was recently announced (*RT&S*, June, p. 24), graduated from Cooper Union Institute of Technology and joined the PRR in June 1941 as a B&B engineering apprentice. After serving with the Corps of Engineers, U.S. Army in World War II, he returned to the PRR in May 1946 and in October 1947 was appointed assistant master carpenter on the Maryland division. In March 1948 he was transferred to the Philadelphia Terminal division and in August 1950 began service with the 724th Railway Operating Battalion, U. S. Army. He returned to the PRR in August 1952 as supervisor of structures on the Altoona district—the position he held at the time of his recent promotion.

Donald Jay Bertel, 31, whose promotion to assistant division engineer on the Missouri Pacific at Kansas City was recently announced (*RT&S*, July, p. 30), graduated from the Missouri School of Mines and joined the MP in September 1944, and worked in various positions in the road's engineering and maintenance departments until February 1956 when he was named assistant roadmaster on the Arkansas division. In September 1956 he was named assistant engineer—the title he held at the time of his recent promotion.

George W. Martin, 46, whose promotion to roadmaster on the Seaboard Air Line at Hamlet, N. C., was recently announced (*RT&S*, June, p. 24), joined the SAL in 1934 as a section laborer at Elberton, Ga. He subsequently served as apprentice foreman, section foreman, assistant foreman on system rail gangs, and rail gang foreman until 1952 when he was promoted to assistant roadmaster at Richmond, Va. In 1953 he was transferred to Hamlet, to supervise track work in the construction of the classification yard—the position he held at the time of his recent promotion.

William A. Thompson, Jr., 26, whose promotion to assistant division engineer on the Seaboard Air Line at Savannah, Ga., was recently announced (*RT&S*, June, p. 24), graduated from Georgia Institute of Technology and joined the SAL in September 1954 as a student engineer at Raleigh, N. C. He was named assistant to the division engineer at Savannah, Ga., in March 1956—the position he held at the time of his recent promotion.

Vaughn W. Oswalt, 59, recently promoted to superintendent, maintenance equipment, on the Central of Georgia at Macon, Ga., (*RT&S*, April p.78), began railroading with the Southern as supervisor of work equipment at Cincinnati, Ohio, in 1942. He served in a like capacity at Washington, D.C., and at Charlotte, N. C.,

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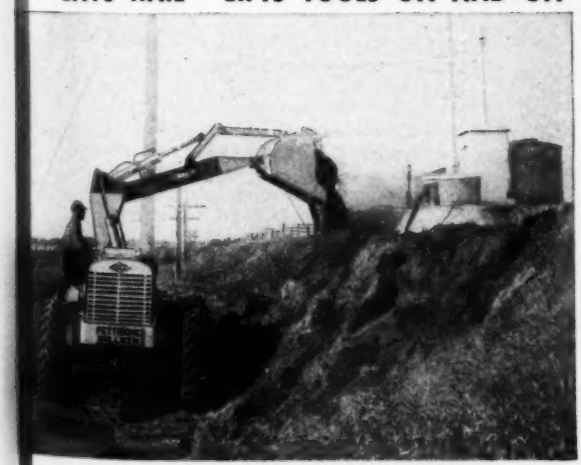

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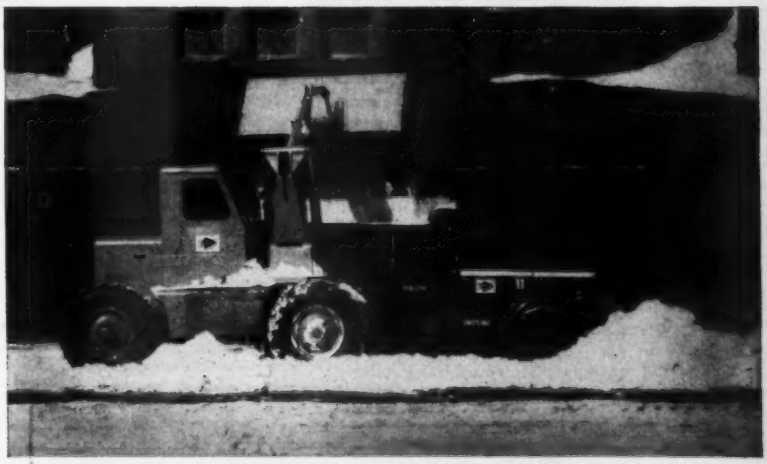

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Biographical briefs (cont'd)

prior to his recent appointment on the CofGa at Macon.

Emil M. Northenscold, who recently retired as division engineer of the Soo Line at Enderlin, N. D., (*RT&S*, May, p.32), began railroading in 1909 with the Northern Pacific. He joined the Soo in 1923 as a chainman and rodman and in 1926 joined the Burlington as an assistant engineer—valuation. He returned to the Soo the following year as assistant engineer, construction and maintenance, in which capacity he served at Minneapolis, Minn., and at Fond du Lac, Wis. In February 1930 he was promoted to division engineer at Gladstone, Mich., and subsequently served as assistant engineer and division engineer at Enderlin, Minneapolis, Stevens Point, Wis., and Marquette, Mich., until 1943 when he was named division engineer at Minneapolis.

Supply Trade News

AUSTIN-WESTERN—Henry P. Lockhart has been named assistant general manager of the Austin-Western Construction Equipment division, Baldwin-Lima-Hamilton Corporation.

A. M. BYERS—William R. Doreen, formerly associated with Republic Steel Corporation and Mid-West Material, Inc., has joined the company as a field service engineer with headquarters at Houston, Tex.

HOWARD & GOULD CO.—Raymond W. Otte, who has been associated with the company for several years, has been admitted to the partnership. The **R. E. Bell Company,** 2089 Railway Exchange Building, St. Louis 1, Mo., has been appointed representative in the railway field—Southwestern territory—for the company's twist drill bits for signal bonding and tie drilling.

Association News

American Railway Engineering Association

A number of committees have scheduled meetings to be held at the Conrad Hilton hotel, Chicago, in September during the conventions of the Roadmasters' and Bridge & Building Associations. The committees and the dates of the meetings are: Roadway and Ballast, September 23-24; Rail, September 24; Track, September 25 (Subcommittee 3 will meet September 24); Buildings, September 24; Wood Bridges and Trestles, September 24; Masonry, September 23-24; Records and Accounts, September 24-25; Yards and Terminals, September 25; Economics of Railway Location and Operation, September 24; Contract Forms, September 24-25; Economics of Railway Labor, September 23; Maintenance of Way Work Equipment, September 23-24; Clearances, September 24.

Railway Tie Association

Robert M. Hamilton who recently retired as executive vice-president of D. B. Frampton & Co. (*RT&S*, June, p. 24), has been named assistant secretary-treasurer of the Railway Tie Association, effective August 1. At the end of 1958, Mr. Frampton is slated to become secretary-treasurer of the association, succeeding Roy M. Edmonds, who will retire at that time. After his retirement, Mr. Edmonds will continue as a consultant for the RTA.

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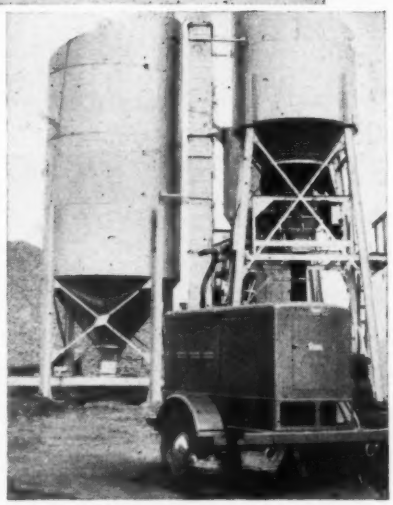

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Helps from manufacturers

The following compilation of literature —including pamphlets and data sheets —is offered free to railroad men by manufacturers to the railroad industry. To receive the desired information, write direct to the manufacturer.

MOTOR SCRAPERS. Performance and design features of the TS-160 motor scraper, recently added to the manufacturer's motor scraper line, are featured in an 8-page illustrated catalog (MS-1226) now available. Photographs, illustrations and specifications are used to tell the new model's design and construction story. (Write: *Allis-Chalmers Manufacturing Company, Tractor Group, Dept. RTS, Milwaukee, Wis.*)

CRANE EXCAVATORS. A six-page bulletin has recently been made available, covering the Bantam Model T-35 crane-excavator. The two-color bulletin features application and engineering data on the company's 7 and 8-ton carrier-mounted machines, as well as brief specifications and illustrations of the three crane carriers manufactured by the firm. Charts and illustrations give dimensions and operating data on the shovel, backhoe, clamshell, dragline and crane attachments. Detailed specifications, design features, and optional equipment are also illustrated and described. The bulletin is designated TCR-202. (Write: *Schield Bantam Company, Dept. RTS, 999 Park St., Waverly, Iowa.*)

AIR TOOLS. A new 8-page bulletin explaining troubles encountered, causes, and remedies when using rock drills are now available. The bulletin—AT-116B—is entitled, "I know air power." In addition to the rock drill "trouble-shooting chart," two pages of the bulletin are devoted to

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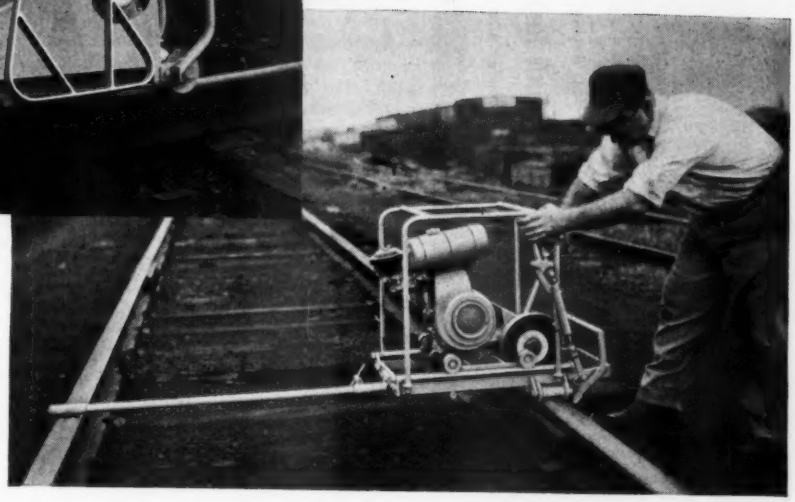

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Manufacturers' helps (cont'd)

the growing usage of air as power. Pictures and drawings are used to illustrate construction and maintenance of various air tools. (Write: *Sales Promotion Department, Dept. RTS, LeRoi Division, Westinghouse Air Brake Company, Milwaukee* 1, *Wis.*)

TRUCKS, ATTACHMENTS. Trucks and attachments for mechanical handling applications are covered in a 12-page condensed guide covering the manufacturer's complete line of basic truck models. Working specifications for each truck shown in the catalog include load capacity, stacking aisle and turning radius, tire size, grade-climbing ability, engine horsepower, lifting and travel speed, weight of truck and optional equipment. Summaries of the outstanding features of each unit are also covered. A wide range of attachments designed for specialized job applications and other optional items are also featured in the catalog. (Write: *Hyster Company, Dept. RTS,* 2909 *N.E. Clackamas St., Portland* 8, *Ore.*)

ENGINEERING SHORTCUTS. A new booklet has been made available showing 59 shortcuts to speed drafting and computation work. The booklet entitled, "Time Saving Tips for the Draftsman and Engineer," shows new approaches to old problems. The booklet was compiled from a survey made of leading engineers and draftsman inquiring into what techniques they use to save time without sacrificing precision in their work. (Write: *Reader Service Division, Dept. RTS, Frederick Post Company,* 3650 *N. Avondale Ave., Chicago* 18).

EXCAVATORS. A new, two-color booklet, entitled "Time to Consider Traxcavators," has recently been released. The booklet shows on-the-job photos and reports the many different tasks that the machine can handle. Describing these machines working in mining, construction, logging and other operations, the booklet also lists some of the available attachments which extend their versatility. (Write: *Caterpillar Tractor Company, Advertising Division, Dept. RTS. Peoria, Ill.*)

TRUCK BUMPERS. A new catalog sheet, describing and illustrating its line of Flex-O rubber truck bumpers, has just been released by the manufacturer. The literature highlights the three standard sizes available, with detailed specifications, photographs, and engineering sketches. Complete installation information is also included. (Write: *Bumpers, Inc., Dept. RTS. 2534 Detroit Avenue, Cleveland 13, Ohio.*)

MACHINE REPOWERING. A new booklet describes, through illustrations and descriptions of successful installations how the manufacturer's diesel engines help raise production on old machines. Also listed are some of the optional equipment and factory service available for repowering. The booklet is entitled: "Repowering Made Easy." (Write: *Caterpillar Tractor Company, Advertising Division, Dept. RTS. Peoria, Ill.*)

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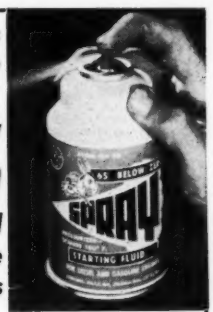

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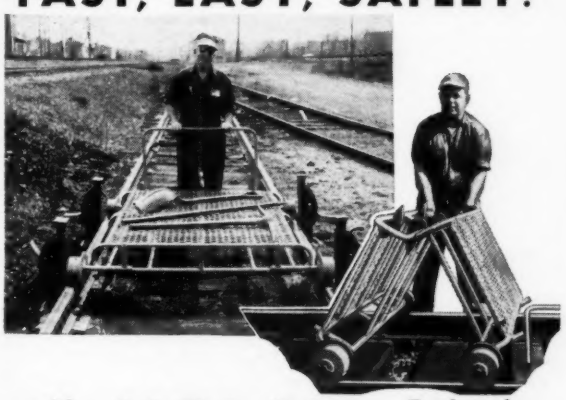

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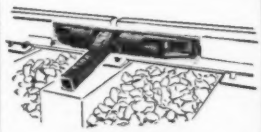

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